

TENNESSEE VALLEY AUTHORITY OVERSIGHT

HEARINGS
BEFORE THE
SUBCOMMITTEE ON
REGIONAL AND COMMUNITY DEVELOPMENT
OF THE
COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE
NINETY-NINTH CONGRESS
FIRST SESSION

JULY 15, 16, AND 30, 1985

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TENNESSEE VALLEY AUTHORITY OVERSIGHT

MONDAY, JULY 15, 1985

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
SUBCOMMITTEE ON REGIONAL AND COMMUNITY DEVELOPMENT,
Washington, DC.

The committee met at 2 p.m., in room SD-406, Dirksen Senate Office Building, Hon. Gordon Humphrey (chairman of the subcommittee), presiding.

Present: Senators Humphrey, Lautenberg, and Burdick.

Also present: Senator Stennis.

Senator HUMPHREY. Good afternoon.

I welcome our colleagues to this important hearing. Let me defer, before I proceed to Senator Stennis and ask if he would care to proceed first? Senator Stennis.

Senator STENNIS. I thank you very much. I have the privilege of being back tomorrow for a short statement. I must say this is one of my old stomping grounds. The reason that I came here is that they made me an ex officio of the Appropriations Committee to cover this work.

I started out there. I just kind of float along with this, you know. When you have a meeting, I like to come. Thank you very much.

Senator HUMPHREY. You are welcome. We are glad to have you here, Senator Stennis.

I likewise defer to Senator Burdick, if he would care to proceed?

OPENING STATEMENT OF HON. QUENTIN N. BURDICK, U.S. SENATOR FROM THE STATE OF NORTH DAKOTA

Senator BURDICK. Mr. Chairman, this is the first of three scheduled hearings on the Tennessee Valley Authority. The last time the subcommittee held an oversight hearing was in 1981 on the power program. I welcome this series of hearings as a means to evaluate OMB's 70 percent budget reductions that are proposed.

TVA is a unique Federal corporation which combines a power program with responsibility for enhancing natural resources and economic development activity within a seven-State area.

Some have questioned whether or not TVA should be involved in programs outside of providing power. The purpose of these hearings is to review nonpower programs as to the benefits provided to the TVA States and their value as national demonstration projects.

I look forward to an informative hearing and discussions on TVA programs.

OPENING STATEMENT OF HON. GORDON J. HUMPHREY, U.S.
SENATOR FROM THE STATE OF NEW HAMPSHIRE

Senator HUMPHREY. Thank you, Senator Burdick.

Today the Subcommittee on Regional and Community Development begins 3 days of oversight hearings on the Tennessee Valley Authority.

Let me say that I envision that this will only be the first of a series hearings. I have discovered, in my preparation, that this is a complex area that has not had a thorough, comprehensive congressional oversight, that I am aware of, in 4 years. For my part, I intend to make it just that.

We welcome the three members of the TVA Board of Directors, Chairman Charles H. Dean, Jr., Director Richard M. Freeman, and Director John B. Waters.

A critic of the Tennessee Valley Authority once charged that neither politics nor the market control the TVA budget. To the extent that such a charge is true underscores the need for vigorous oversight of this agency on the part of the Congress.

Yet, it has been more than 4 years since this committee—which has oversight responsibilities over TVA—has taken an in-depth look at the TVA. That is why we are here today.

It would appear that these hearings are not only long overdue, but they are also coming at a critical point in the 52-year history of the agency. The list of the events involving TVA suggests a preliminary agenda to these hearings.

The TVA's chairman, Mr. Dean, and our witnesses here today, have recently spoken of the "crisis of management" in TVA's power program.

Indeed, the Nuclear Regulatory Commission recently wrote to Mr. Dean and criticized TVA for a "substandard and consistent history of poor performance," in TVA's nuclear power program.

"The disproportionate magnitude of violations, number and severity, level of civil penalties, and management-related nature of the violations which compared to other utilities serves to highlight the overall management weakness," the NRC stated in a letter to Mr. Dean on July 3.

TVA's Brown's Ferry Nuclear Facility has shut down after an unprecedented number of regulatory violations, including fines totaling more than \$700,000 since 1981.

Construction and licensing procedures at TVA's Watts Barr project have been delayed because of safety concerns. Two months ago, TVA's Sequoyah Nuclear Facility was shut down. And TVA was recently fined \$112,000 over an incident at that facility last year.

TVA has stated that, in part because of problems with its nuclear program, it will have to raise rates up to 9 percent this fall.

The Department of Energy recently announced that it will close its Oak Ridge uranium enrichment facility, throwing thousands of employees out of work. The Department of Energy cited TVA's excessive power costs as a reason for closing the plant.

In November 1983, this subcommittee held hearings on the issue of TVA's contractual relationship with DOE and the continuing burden that TVA's rates posed to the Nation's uranium enrich-

ment program. Other industries throughout the TVA region have also announced that they will close because of power rates.

Calling the initiative part of a "government-wide effort to eliminate subsidies, which, at national expense, serve local and regional interests," the Reagan administration is seeking a 71-percent cut in the TVA budget for its nonpower appropriated programs.

"Special purpose Federal spending for local development merely redistributes development while resulting in higher taxes and interest rates," the administration has argued.

The Senate concurred with the President's recommendation, though the House voted for a much lower reduction for TVA programs in their budget resolution. The matter is now before the Budget Conference Committee.

The fact is, because TVA is a self-authorizing and somewhat free-wheeling agency, oversight is one of the very few mechanisms that exist for anyone outside of the agency to look in and determine what TVA is doing.

Given that TVA will soon ask its ratepayers to accept a large rate increase, it is imperative that this committee, on behalf of the millions of ratepayers in the Tennessee Valley, take a close look to see why TVA needs so much more money.

Similarly, given that TVA is asking the American taxpayers to go even deeper into debt to finance TVA's nonpower programs, it is vitally important to closely examine what that money will be spent for.

Beyond these significant, though somewhat immediate, questions, it is my hope that these hearings will also provide an opportunity to take a broader look at TVA as an institution.

After 52 years, it is important to step back and determine what effect TVA has had on the 7 million people of the Tennessee Valley, for whom TVA exists to serve, as well as every taxpayer in this Nation who are asked to help finance TVA programs.

It is my hope that these hearings will add a new dimension to our collective interpretation of what TVA has and has not accomplished, and how well TVA has served or has not served the people.

It is only with the benefit of such a record that we will be able to determine what options exist for the future of the Tennessee Valley Authority.

Let me also add that—a good deal of apprehension seems to have been aroused by the scheduling of these hearings, both in the region served by the TVA and here in the Congress, particularly among the Members who represent the area.

For this to be a constructive effort, over the next several months, I think we must find ways to make the TVA accountable. Today, it is largely unaccountable. It is autonomous. It is, in my view, autocratic, and even dictatorial.

In such an institution, the setting does not work well any longer, particularly for the ratepayers. It is about time we found some way to champion the cause of the ratepayers of the TVA.

I hope and believe that we can proceed constructively and not on the basis of regional competition or jealousy, that we, Members of Congress, as the only overseers of TVA, in a practical sense, can find ways to be the champion of those that the TVA serves. It is on that basis we proceed.

Mr. Dean, I thank you for submitting your statement. I have read all 50-some-odd pages.

I hope you are not planning to read your statement in full.

Do you have an abbreviated statement, or can you abbreviate your statement?

STATEMENT OF CHARLES H. DEAN, JR., CHAIRMAN, BOARD OF DIRECTORS, TENNESSEE VALLEY AUTHORITY, ACCOMPANIED BY: HERBERT S. SANGER, JR., GENERAL COUNSEL, TVA; AND WILLIAM F. WILLIS, GENERAL MANAGER, TVA

Mr. DEAN. Yes, sir, I have already abbreviated the statement once and then I did it again, Senator.

Before I start, I would like to point out, on my far left is Herb Sanger, the general counsel for the Tennessee Valley Authority; Director Waters, Director Freeman, and Bill Willis on the far end, who is the general manager, who would parallel the chief operating officer in a private corporation.

We have, of course, submitted our statements, Mr. Chairman. I will very briefly talk about TVA's power system. Director Richard Freeman will discuss our Natural Resource Program. Director John Waters will discuss TVA's community and economic development activities.

In evaluating this agency, Mr. Chairman, we ask that you and our parent committee consider not just one part of TVA, but TVA as a whole. We ask that you not consider just what TVA does for the region, but above all, what it does for our Nation.

At TVA, we often say that we are more than an electric utility. And that is true. We do operate the Nation's largest power system which serves 7 million people. It has annual revenues in excess of \$4.5 billion.

On most measures of overall performance, TVA's power system over the years has ranked among the best in the country. The power system is generally well operated and it is self-financed.

TVA's power system has not depended on congressional appropriation for more than 25 years. In fact, the power system is paying money into the U.S. Treasury each year, not taking it out; and it has been doing so since 1961.

Last year, TVA returned to the Federal Treasury more than \$113 million. Of that amount, \$20 million was applied to the repayment of previous Federal investments. More than \$93 million went to pay the Treasury a return on those investments, an amount which is computed annually using the current cost of money to the U.S. Treasury.

TVA's ratepayers are not being subsidized as a result of the Federal investment which was made in the TVA power system prior to 1959. Instead, TVA's power system is paying into the U.S. Treasury at a level never anticipated in that 1959 legislation.

The original Federal investment in the TVA power system has been paid down to the point that it now represents less than 6 percent of the current capital structure of the system.

Not only is the power system proving itself to be a financial asset to the U.S. Treasury, it remains a valuable asset to the Tennessee

Valley region. Electric rates to the residential consumers are still among the lowest in the Nation.

You can see this comparison, Mr. Chairman, on chart 1, which shows 1,000 kilowatt hours sold to a residential customer. On this chart, which covers utilities all over the Southeast, TVA comes out very low.

Chart 2 shows our rates to particularly large industrial users and it shows that they are very competitive also with neighboring utilities. In this case, we are not at the bottom but we are certainly in the lower third. It is a very large block of power.

Clearly, TVA is helping the economy of the valley region by providing reasonably priced electricity. But TVA has to be measured by what it contributes to the Nation, as well as to the region.

As a Nation, we have no more important goal than to continue striving for energy independence. The oil glut that we are experiencing is temporary; each year the world uses more oil than is discovered. And eventually, the pump will run completely dry.

Mr. Chairman, we need to ask ourselves, "What are we doing today to make ourselves less dependent on imported sources of energy and less vulnerable to the whims of other governments thousands of miles beyond our shores? What are we doing to prepare ourselves for an eventual weaning from petroleum?"

TVA has been working for several years with technologies to use our abundant coal reserves as a source of electricity, chemical stock, and liquid fuel. Coal is a native resource which we must learn to use more fully, especially in ways that minimize the environmental damage traditionally associated with its mining and combustion.

TVA was a pioneer in the development and application of chemical scrubbers to limit the amount of pollution that escapes from the smokestacks of coal-fired powerplants.

Another technique to burning coal is called the "atmospheric fluidized bed combustion boiler". It can burn coal more cleanly and efficiently than traditional boilers equipped with the scrubbers which are now required by law for new coal-burning plants.

In a fluidized bed boiler, small bits of coal and limestone are swirled together on a bed of forced air. As the coal is burned, the sulfur dioxide that results from the combustion is captured by the limestone and falls out of the system as harmless ash. In this way, even high sulfur coal can be used as a clean source of energy.

With the help of congressional appropriations, the utility industry, and TVA power system funds, TVA has built and operated for 2 years a 20 megawatt fluidized bed plant with outstanding results.

Encouraged by that success, ground breaking for a commercial-scale 160 megawatt plant will take place later this summer.

Of the \$209 million already pledged for the construction and testing of the commercial-scale fluidized bed facility, \$40 million has been pledged by TVA, \$75 million by the Electric Power Research Institute, almost \$18 million by Combustion Engineering and \$10 million each by the Commonwealth of Kentucky and the Duke Power Co.

An additional \$51 million has been pledged from a number of electric utilities and private corporations throughout the Nation

and the U.S. Congress has provided \$30 million to the Department of Energy for transfer to this project.

Mr. Chairman, this illustrates the type of cooperation among private and public agencies that we are proud to be a part of. It typifies programs throughout TVA and demonstrates an appropriate Federal role in the research and development of promising energy-related technologies.

Coal should become a major source of energy for transportation. About 70 percent of our petroleum is now consumed by transportation. Coal, converted to liquid fuel, could help break our petroleum habit. Coal, burned to make electricity, can do the same.

For example, the United States is far behind Europe and Japan in the electrification of railroads. We're missing an opportunity to use native energy sources to power our trains instead of scarce domestic or imported diesel fuel.

TVA has been talking to railroad companies about a demonstration line running through the valley region to test out the feasibility and economics of railroad electrification.

TVA, in cooperation with the Electric Power Research Institute, is also involved in the testing and improvement of batteries and support systems for electric vehicles. These may seem far-fetched today, but promising breakthroughs and scarce petroleum could turn today's oddity into tomorrow's necessity.

TVA is a leader in the conservation of electricity, but we also believe that the intelligent substitution of electricity for petroleum is vital to this Nation.

The message behind these programs is clear, Mr. Chairman. TVA's power system is not just generating kilowatt hours for use in valley homes and industries. It's also on the leading edge of energy R&D that will make a difference in the way energy shapes the future of this Nation. We feel that our contributions to energy independence will be an important part of that future.

In conclusion, the quality of life that we now enjoy as a Nation depends on how wisely we develop and use our domestic sources of energy. As a public agency, TVA strives to develop and use those sources in ways that will help our region and Nation prosper economically and still keep our environment as clean as possible while meeting the energy needs of our growing region.

On the economic side, in the last 2 years, TVA has been offering electricity to its larger industrial users under certain conditions that allow them to save up to 30 percent of their energy charges by buying power that is temporarily available on the system and not demanded by other users.

When the system begins to reach its capacity peak, the supply of cheaper, surplus power is interrupted on a limited basis.

This type of innovative arrangement, known as "interruptible power," helps TVA use its electric generating capacity fully and helps many of the industries we serve remain profitable in an increasingly competitive national and international market. The end result is keeping jobs in the region and the Nation.

On the environmental side, TVA has learned a hard lesson. Before a 6-year, billion dollar environmental cleanup, TVA's coal-fired powerplants were releasing over 2 million tons of sulfur dioxide into the atmosphere each year, affecting air and water quality

not only in the Tennessee Valley, but all along the eastern seaboard and up into New England under certain conditions.

To remedy this situation, and to comply with the Clean Air Act, TVA reduced its polluting emissions by more than one-half, to less than 1 million tons, by installing scrubbers, precipitators, and bag-houses, by building two coal washing facilities and by switching to some lower sulfur coal.

At each plant, we pursued the least-cost option for meeting environmental goals. While the overall cost of meeting these goals proved to be substantial, about \$400 million a year, which represents about 9 percent of present power system revenues, this significant environmental improvement was paid for by the ratepayers of TVA without any Federal subsidy of any kind.

There are other ways TVA's power system helps stimulate economic development and helps preserve natural resources in the valley region. Specific examples will be discussed by my fellow directors, Freeman and Waters.

At this point, we want to stress that TVA's power system is part of a larger whole and demonstrates how a vast public power system can be guided to serve a larger mission of regional development and do so on a self-financing basis.

Thank you, Mr. Chairman. We hope this brief overview of TVA's power programs is helpful. If you have questions, we would be glad to answer them following the comments of Directors Freeman and Waters. Our general manager and other key TVA executives are also here.

STATEMENT OF RICHARD M. FREEMAN, MEMBER, BOARD OF DIRECTORS, TVA

Mr. FREEMAN. Mr. Chairman, it is my pleasure to speak on the natural resource side of TVA's activity.

Senator HUMPHREY. Excuse me, let me interrupt you. How long is your statement?

Mr. FREEMAN. Mine will be 8 to 10 minutes.

Senator HUMPHREY. Is Mr. Waters' likewise?

Mr. FREEMAN. Yes. We have divided the testimony into three pieces.

Senator HUMPHREY. Have you already submitted your testimony?

Mr. FREEMAN. It can be. It is an excerpt of the testimony that has been submitted. We are trying to highlight the testimony.

Senator HUMPHREY. I see. You are going to focus on another part of the testimony that has been submitted?

Mr. FREEMAN. Yes, correct.

Senator HUMPHREY. All right. Will you keep it as concise as possible?

Mr. FREEMAN. I would first like to deal with the National Fertilizer Development Center, Mr. Chairman. Our farmers are feeding today a population 75 percent larger than in the 1930's. And they are doing so on significantly less acres of available cropland.

The use of fertilizer accounts for about 40 percent of this elevated agricultural productivity. And a key to the development and continual improvement of fertilizer has been TVA's National Fertilizer Development Center.

Through an effective technology transfer process and a close working relationship with the fertilizer industry, more than 660 licenses have been issued to the fertilizer industry for the nonexclusive use of TVA developments.

These licenses have gone to 390 companies for use in at least 579 plants in 39 States. TVA fertilizers and fertilizer-related technologies are now used in the production of three-fourths of all fertilizers.

The accumulated benefits to the Nation of TVA's National Fertilizer Development Center have far exceeded the center's total cost. While I tend to be skeptical of benefit cost ratios, I find the estimated 20-to-1 ratio for the National Fertilizer Development Center to be sufficiently high to permit little argument that the benefits significantly outweigh the costs.

I should also mention that about 80 percent of the developmental cost of new fertilizers is borne by the fertilizer industry and farmers through the purchase of experimental products.

There is more work to be done in fertilizer research. Much of the phosphate used in fertilizer today comes from phosphate rock. The amount of high-quality rock is diminishing. TVA is working on a laboratory process that promises to yield as much phosphate from the large deposit of low-quality rock as current technologies yield for high-quality rock.

This process can be successfully moved from the laboratory to commercial producers. American agriculture and American consumers will save millions of dollars by taking advantage of these large deposits of low-quality rock. Equally important, the country will be able to maintain its independence in the supply of this critical fertilizer ingredient.

Another problem being tackled through research is the amount of nitrogen in fertilizers that is being lost to crops, not to the plants, but to the soil and to the water. On the average, about one-third of nitrogen in fertilizers is lost as nutrients in these ways.

We are working on chemical additives for existing fertilizers that will cut these losses, as well as new fertilizers and application processes that will get more of the nitrogen nutrients to the crops.

In our direct statement, we deal with our soil erosion activities, our flood plain zoning, our reservoir water quality program and other related developments. I will not be able to address all those this afternoon in this statement.

I would like to, however, touch on the work we are doing in ground water. As an integrated resource development agency, TVA is concerned not just with those waters that flow above the ground, but also with those that flow or rest quietly below the ground.

This concern is heightened by one simple, yet important fact. Almost two-thirds of all residents in the Tennessee Valley region rely upon ground water for their drinking supply and other uses.

In 1985, after having discovered there was a reasonably serious problem with ground water in our region, which is not atypical from ground water problems around the country, we spearheaded an expensive educational effort in east Tennessee to show local governments what actions they can take to protect their ground water.

We put our considerable technical expertise to use in developing aquifer maps, in designing effective land use plans, creating educational programs, and assisting local officials in devising plans to protect their recharge areas.

A recent publication makes our findings available to communities throughout the region and the Nation.

Just last month, TVA's chairman, Mr. Dean, presented testimony before this committee, or subcommittee, on our ground water related findings, what we believe to be some of their State, regional, and national complications.

Turning to air quality, what we have learned about maintaining air quality also provides valuable information for the Nation. You have already heard, Mr. Chairman, about TVA's environmental cleanup of its coal-burning plants. Going through this process encouraged TVA to take a positive stance on the acid rain problem.

Last year, the board of directors advocated a policy of further reduction of sulfur and nitrogen oxides using least-cost strategies and has urged the passage of national legislation to this end.

But TVA's concern for air quality does not stop with sulfur dioxide and acid rain. You have heard about our Energy Conservation Program, that it is good economics, which it is, but equally important, it is good for the environment.

By reducing the peak demand by over 1,000 megawatts already, we are reducing our need for a large steam plant or nuclear unit. A plant that we don't have to build saves resources. A plant that we don't have to build means less air pollution and less radioactive wastes to handle.

Whether it's the quality and use of our air, land or water, TVA has a responsibility to look after, and to the extent possible, help care for the region's resources in an integrated way. TVA is not just a land agency, nor a water agency, nor an air quality agency, but a regional, integrated resource development agency concerned with each of these fundamental resources as they exist in nature's unity.

From its inception, TVA has offered programs designed to teach people about their environment. These programs began with TVA's first project in Norris Dam and they continue today at TVA's Land Between the Lakes and through TVA's university-based environmental and energy education centers.

Our role as a national demonstration is vitally important to us and we believe to the Nation. Our work in fertilizer research, soil erosion, flood plain zoning, improving the reservoir water quality, protecting ground water and addressing the Nation's most important air quality issues, give you an idea of what we mean when we say that "TVA is serving the Nation while helping its region".

Aside from our direct contributions to national life, what others can learn from our experiences, both from our successes and from our failures, is one of the principal benefits and most lasting legacies.

As I mentioned, TVA was established as an experiment. As any experiment, it means it is meant to be learned from, to be a source of testing and dissemination. And, as an experiment, we believe that TVA continues to be successful, especially as it demonstrates

time and again the usefulness and even necessity of integrating regional resource development.

This principle is the very basis of TVA. Although programs change in response to changing needs and conditions, adherence to this principle will be the true historic test of the Tennessee Valley Authority.

I would like my colleague to discuss our economic and community development.

Senator HUMPHREY. Very well, Mr. Waters, will you keep it as brief as possible, please?

STATEMENT OF JOHN B. WATERS, MEMBER, BOARD OF DIRECTORS, TVA

Mr. WATERS. I certainly will, Mr. Chairman. I would like to focus for a few minutes on TVA's accomplishments through its congressionally funded programs for community and economic development.

Before I do that, I would like to take the opportunity to let you know that, along with Chairman Dean, I am a native of the Tennessee Valley and I have had a chance to see firsthand what TVA has helped this region do.

There are plenty of people where I come from that can remember what life was like before TVA brought electricity to rural communities or controlled flooding along the Tennessee River and some of its tributaries, or helped farmers get more out of their land, or helped create new jobs where they were desperately needed.

These are the kind of people, Mr. Chairman, that don't come to Washington to testify. They don't appear on anybody's list of expert witnesses. But they know in their hearts what TVA has meant to them. I am proud to be one of those people, Mr. Chairman.

Also, before I get into the specifications of our community and economic development efforts, I want to say a few words about the concept of regional development, because I think this approach to achieving social and economic progress is very important, especially when the region is a true region and not one just artificially drawn on a map.

The Tennessee Valley watershed is just such a true region. It is tied together in nature with a geographical, ecological, and social integrity. I am not intending to imply there is no diversity in the region; there is. But it is a true region, and therefore, lends itself to a comprehensive regional coverage.

Our view of TVA is such that an agency should build local initiative and help local communities stand on their own two feet, that limited Federal funds should be leveraged through cooperative projects to attract private and public contributions at the local level, and though such cooperative projects address practical, down-to-earth problems of the communities, that community and economic development should take into full account the continual interplay between humans and their environment.

We also believe that TVA should not be offering programs that duplicate those of other Government agencies, programs that don't

yield positive results and, more especially, programs that are not truly needed. Common sense would dictate this for any responsible governmental organization.

TVA helps to build self-reliant communities by lending a hand, not a handout. Sometimes a small amount of seed money is needed to prime the economic pump. But that money is typically leveraged with local and State contributions.

This reflects TVA's basic belief that community and economic development, in most instances, should grow from community self-sufficiency and not simply create a dependency on outside funds. I want to illustrate this with several of our programs, and there are several.

Working with local chambers of commerces and other development groups, TVA's Townlift Program provides technical assistance to help local communities devise sound strategies to increase their tax base, improve local markets and create new jobs.

In fiscal 1984, townlift planning and development assistance was provided to 68 communities in the valley region. Largely, as a result, more than \$25 million in private and public funds was leveraged to implement downtown restoration and business district redevelopment projects.

For every dollar invested by TVA in townlift projects, more than \$30 was attracted from other private and public investors.

The success of townlift in creating jobs and upgrading the appearance and functioning of downtown areas has led to its use as a model for a national program sponsored by the National Trust for Historic Preservation. That program is called Main Street, U.S.A.

Another program that I would like to tell you about is in Tupelo, MS. TVA, in cooperation with the local educators and community leaders, helped design a system for bridging the gap between the skills needed by the community and those being taught in school.

A needs assessment was conducted to determine the vocational skills needed to keep local businesses vital and then a detailed plan and coordinated vocational curriculum was devised to meet those needs.

This, Mr. Chairman, is a far cry from the type of vocational training that was available when I was in high school in east Tennessee. At that time, the only vocational training that was offered was a course called "vocational agriculture." And if you wanted vocational training, you took it whether or not you or the community needed it.

To date, the success of the Tupelo model for technical career development has attracted the attention of educators and business leaders from five States outside of the Tennessee Valley and from several foreign countries.

The Tennessee Valley Authority is vitally concerned about these limits and their effects on economic development and we're totally committed to the proposition that balanced growth is possible through the wise use and conservation of natural resources. Furthermore, we practice what we preach.

For instance, by cleaning up its own air pollution, TVA is making it possible for other industrial concerns to expand or locate in the valley region without exceeding existing air standards. And

we'll work with them in making sure the environment remains protected.

By cooperating with others along the Holston River in achieving a cost effective solution to water quality problems, TVA hopes to pave the way for future residential and economic development along that river. And the productive limits of this region's lands would have certainly been reached by now without TVA's fertilizer and soil erosion programs.

When it gets down to the real world, the principle of self-reliance, cooperation, and interdependency are important, but so is the principle of practicality. And there is no more practical problem in any region than how to create needed good paying jobs.

In cooperation with 160 electric power distributors across the seven-State valley region, TVA is showing how this practical problem can be solved by assisting small and medium sized manufacturing firms in meeting the challenges of expansion.

Distributors of TVA power help identify companies with the potential for expansion and help coordinate technical assistance provided by TVA. Assistance is available in achieving energy efficiency in planning expansions that are in compliance with environmental regulations, in employee training, and in other areas that help these firms expand.

To date, this program has assisted more than 300 companies allowing them to expand and create more than 10,000 new job opportunities for valley workers.

Since one of the aims of this program is to train unemployed workers and put them to work in newly created jobs, an important side effect is achieved. For every dollar invested in the program, \$20 is saved in State and local unemployment and public assistance payments.

The department of energy of Oregon, the State of North Carolina, and the National Rural Electric Cooperative Association have held preliminary meetings with representatives from our existing industries program to explore the possibility of setting up similar programs in Oregon, Minnesota, North Carolina and other areas outside the valley. Here again, we're trying things out in the valley region and then sharing our suggestions with others.

Before concluding our discussion of TVA's community and economic development programs, Mr. Chairman, we feel compelled to set the record straight on two points of misunderstanding. One pertains directly to our community and economic development efforts and the other touches on a related matter.

Some people have argued that the Federal investment in TVA's community and economic development activities constitutes an unfair regional advantage. And some have argued that the investment in TVA's system of dams and reservoirs has not paid off, either for the region or for the Nation. Both arguments are ill-founded and both need to be corrected.

On the issue of fairness, the valley region is not receiving a disproportionate amount of Federal expenditures through the community and economic development programs of TVA, or even the expenditures of TVA as a whole.

Put in another way, if you ask the question, "Do the people of the valley region gain an advantage over people in other regions

due to congressional appropriations to TVA?" The answer is, clear and simply, no.

First, it's important to realize that there is a considerable variation in Federal expenditures among individual States or regions, for a number of reasons. There is also a variation in the programs for which those expenditures are made.

Urban States receive more mass transit funding. Rural States get more soil conservation money and so on. To see if one State or region is gaining an advantage over another, you need to look at averages.

On a per capita basis across the country, Federal expenditures in Fiscal Year 1984 averaged \$3,022. According to the Bureau of Census, the four principal valley States, Alabama, Kentucky, Mississippi and Tennessee, received, on average, \$2,841 or 6 percent less than the national average.

However, this average included all of TVA's expenditures as Federal expenditures, even though about 96 percent of these expenditures are financed completely by the region's ratepayers, not the Nation's taxpayers.

If TVA's power expenditures are subtracted out, because they don't represent a true Federal expenditure, per capita Federal spending would average \$2,708 in the four States, slightly more than 10 percent below the national average.

Clearly, the four principal valley States are gaining no regional advantage through Federal expenditures.

TVA's federally appropriated budget, expressed per valley resident, amounted to about \$21 in 1984. Much of this, however, is accounted for by programs that are clearly national, not regional, in scope, such as the National Fertilizer Development Center, which Mr. Freeman discussed.

Also included in this filing are TVA programs which provide services similar to those provided in other regions by other Federal agencies, such as the Bureau of Reclamation or the U.S. Army Corps of Engineers. Therefore, these particular programs don't contribute to any sort of regional advantage.

If nationally targeted programs and programs whose services are analogous to those provided in other regions by other agencies are netted out, the residual comes to about \$6 per valley resident.

This amount is not enough to warrant a claim that the TVA region is gaining an edge due to Federal appropriations coming through TVA.

To take it back to a national level, if this \$6 is added to the average per capita Federal spending of \$2,708 for the four principal valley States, an adjusted figure of \$2,714 is obtained. This adjusted figure is still almost 10 percent below the national average.

Thus, Mr. Chairman, TVA clearly does not distort or really even influence, in a discernible way, the flow of Federal budget funds among the States.

The economic impact of TVA's dams and reservoirs can also be described in concrete ways, Mr. Chairman, ways that we noneconomists can better understand. TVA's 37 dams and 14 main and auxiliary locks on the Tennessee River and tributaries create 650 miles of navigable waterways and 11,000 miles of shoreline.

The waterway system is producing more than 17 billion kilowatthours of electricity each year and is saving shippers approximately \$160 million per year in freight costs. And over the year, it has prevented almost \$3 billion in flood damage.

In addition, since 1945, private industry has invested more than \$4.5 billion in waterfront facilities. And these facilities have employed as many as 45,000 people. That's the kind of economic return almost anyone can understand.

Mr. Chairman, that concludes my statement on Community and Economic Development.

Mr. DEAN. Mr. Chairman, we appreciate your interest in TVA and, before we get too far along, I would like to invite you, sincerely, to come down and visit—to spend some time and let us show you what we are doing.

Senator Stennis, Senators Gore and Sasser have had the privilege of growing up in that country.

Senator HUMPHREY. Thank you. One of the statements with which I can agree with at the outset is that it is pretty country and there are fine people there. I have been flying down there in small airplanes and it is a lovely part of the country. There is no question about that.

There are some questions about some of the other statements that were made. We will get to them in due course.

I want to turn now to the ranking member of the subcommittee, a man who knows a good investment when he sees one, a man with a lot of expertise, Senator Lautenberg.

**OPENING STATEMENT OF HON. FRANK R. LAUTENBERG, U.S.
SENATOR FROM THE STATE OF NEW JERSEY**

Senator LAUTENBERG. Thank you very much, Mr. Chairman.

A good investment by our country is an investment in a project like TVA. A lot of things take place in the wonderful State of Tennessee. We have with us two distinguished Senators that serve this region, Senator Stennis, a man whose skills are known to everybody and, of course, Senator Baker before you. A case has been well made before you gentlemen.

I am sorry I was late in arriving. The distance from here to New Jersey doesn't seem very long, but with a cancelled flight, the distance grows very rapidly.

I should have asked the chairman to fly me down.

The Tennessee Valley Authority was established by an act of Congress in 1933. It has had a long and illustrious history. There are many contributions made by the Authority to research and development. I am interested in the AFBC—I guess, is the acronym for the programs, the research to which we have an abundance.

Some of the projects like flood control are helping us get back to protecting endangered species. I began a campaign in the New York Harbor to try to protect the striped bass and being reminded about the snail darter, I would appreciate it if you could find something that would help me make my case.

But in any event, I have a statement, Mr. Chairman, the entirety of which I would like to submit for the record, if it is all right, and then I will get on with my questions.

[Senator Lautenberg's statement follows:]

STATEMENT OF SENATOR FRANK LAUTENBERG
OVERSIGHT HEARINGS ON THE PROGRAMS OF THE
TENNESSEE VALLEY AUTHORITY
SUBCOMMITTEE ON REGIONAL AND COMMUNITY
DEVELOPMENT
JULY 15, 1985

I am pleased to be present this afternoon as the Subcommittee on Regional and Community Development begins three days of hearings on the programs and policies of the Tennessee Valley Authority.

The Tennessee Valley Authority, established by Act of Congress in 1933, has had a long and illustrious history. It is the only Federally-established agency in this country that combines a responsibility for producing large quantities of electricity while at the same time protecting and enhancing natural resources and economic development activity in the area it serves.

This is not to say that TVA has been without its problems, particularly in the past decade. The agency has been under attack for environmental reasons associated with water projects and violation of the Endangered Species Act. TVA for some time was also in violation of the Clean Air Act with regard to sulfur dioxide discharges from coal-fired plants. These problems have, for the most part, been resolved.

At the same time, TVA has been a leader in national demonstration projects in a large number of environmental, agricultural, educational, and economic development areas.

The President has recommended a 70 percent cut in TVA's appropriated programs; in other words, programs not funded from the independent power program.

The Subcommittee on Regional and Community Development has jurisdiction over the Tennessee Valley Authority. It has been a long time since the Subcommittee has looked at TVA's programs. Our last major hearings were held in early 1981, and concentrated on the power program rather than the other, appropriated programs.

I welcome this opportunity to become better informed about this important agency, an agency which is truly unique in its broad charter and in its long history of accomplishments. At the same time, I think we should look closely at all these non-power related demonstration programs. How many of these are truly national in scope? How many have in fact been established in other parts of the country as a result of TVA's pioneering efforts? How many are perhaps duplicative of programs which are or which could be operated by other Federal and State entities, or even by the private sector?

With regard to the power program itself, we obviously need to look at the problems that evidently exist within TVA's nuclear program. I find it alarming that the Nuclear Regulatory Commission earlier this month notified the Chairman of TVA's Board of Directors that it found that there were "performance deficiencies at TVA's nuclear facilities as indicated by a sustained and consistent history of poor performance..." I am sure we will be spending some time this afternoon on that issue.

Mr. Chairman, I look forward to hearing the testimony of TVA's Board of Directors this afternoon, and to the other witnesses tomorrow and later this month. Thank you.

Senator HUMPHREY. I am going to have to ask you to withhold questions, Senator. We are just taking statements.

I would like to recognize, in the order of their arrival, the distinguished Senators from Tennessee. I welcome them sincerely because as I said in my statement, this is meant to be a constructive effort, comprehensive as well as constructive.

It is meant to find a way to identify the root problems of TVA and hopefully make some structural changes so the people served by TVA will be better served, to reintroduce accountability into the affairs of TVA.

Senator Sasser.

STATEMENT OF HON. JIM SASSER, U.S. SENATOR FROM THE STATE OF TENNESSEE

Senator SASSER. Thank you very much, Mr. Chairman. I want to express my appreciation to you and to the distinguished members of this committee for allowing me to participate in these opening hearings here today.

I want to say that I believe these hearings can serve a very worthwhile purpose. I think they will serve the purpose of TVA coming before this committee and before the Senate and explaining in some detail precisely what their activities have amounted to over the past decade, what their plans are for the future, what their contributions have been, on both a national and a regional basis, and what they anticipate their contributions to be in the future.

I am hopeful, I am confident, Mr. Chairman, as this testimony unfolds, that we will find that the Tennessee Valley Authority has been a force for significant progress, not only in our region, the Tennessee Valley area, but also for the Nation as a whole.

As we learn of their activities in controlling sulfur dioxide, air pollution, their concern with acid rain—which I know the chairman of this committee is vitally concerned with—the contributions they have made in the field of fertilizers, fertilizer research, the contributions they have made, essentially, to the green revolution, that has occurred not just in the United States, but in other lesser developed countries, as a result of the research, has been done by this very fine agency.

So I think this will be a very useful, productive hearing, Mr. Chairman. I think we would all agree here that nobody is perfect. I find that I don't even agree with my wife 100 percent of the time and I am hopeful that during the course of these hearings we will also come up with some constructive criticism of the Tennessee Valley Authority, in such a way that they can take these constructive criticisms that the chairman and others might have, and go forward and have an even better and more productive Tennessee Valley Authority in the years ahead.

Again, my appreciation to you, Mr. Chairman, for allowing me to appear here as a guest of your subcommittee.

Senator HUMPHREY. We are glad to have your participation, Senator Sasser.

Senator Gore.

STATEMENT OF HON. ALBERT GORE, U.S. SENATOR FROM THE
STATE OF TENNESSEE

Senator GORE. Thank you very much, Mr. Chairman. I, too, would like to thank you for your courtesy in allowing us, from the Valley, to sit in on these hearings. They are very important to us, because we are anxious that you and the members of this subcommittee get a clear and unobstructed view of what TVA is all about and what it has meant, not only to our part of the country, but to the entire Nation.

Many Tennesseans and other residents of the Valley who are older than I speak vividly of "the day when the lights came on." And that phrase describes, in a short way, the essence of what TVA meant to the Tennessee Valley.

But its meaning goes beyond that as well. It signaled the beginning of a national commitment to make of the Tennessee Valley not a liability, but an asset for the entire Nation. Indeed, the entire Nation is better off as we have lifted the economic growth rate in the Tennessee Valley up towards the national average. It is not there yet. TVA has much work yet to be done. But it has already made a tremendous difference.

I will have a formal statement in tomorrow's hearing. As a result, I will not abuse the subcommittee's time on this occasion. But I would like to make one other brief point. That is, I hope in these hearings, you and the members of the subcommittee will be aware of the asset TVA is, not just for the States directly served, but for the entire country.

If I could give you just one brief personal example. I was serving as a member of the Energy Subcommittee in the House of Representatives at the height of the energy crisis. The country looked around and tried to figure out how to design an insulation program to encourage energy conservation.

They found, in the TVA region, a program already designed by TVA, that had already been started. As a result, they were able to take from the TVA and quickly implement it nationwide.

There are dozens and dozens, literally hundreds, of other examples of developments begun in the TVA region by TVA which have proven to be a tremendous benefit for the entire country.

When it was first started, this was one of the purposes, to have it serve as a yard stick, as a laboratory for the Nation, as a place where things can try to be done right.

Whatever its shortcomings are, that are identified, I know that the leadership of TVA is interested in addressing whatever opportunities are identified for the rest of the country to benefit by TVA's work. I hope it will receive equal attention.

Thank you for your courtesy, Mr. Chairman.

Senator HUMPHREY. Thank you, Senator Gore, for participating in this work. Indeed we are going to have a separate hearing tomorrow, just to show our desire to accommodate all the interested members, principally from the region.

We are going to be taking the statements tomorrow of some 15 or 16 members from that region and we want to have their cooperation. We want to get to the root problems. There are clearly problems. We want to get to the root causes. We want to determine

whether structural changes are in order to ensure that TVA is accountable.

All right. So much for the preliminaries. Now, Mr. Dean, you have brought some attractive charts with you. Who produces those charts for you? Are those internal?

Mr. DEAN. Internal, yes.

Senator HUMPHREY. Which office produces those charts?

Mr. DEAN. The information office.

Senator HUMPHREY. How many people are employed by the information office?

Mr. DEAN. About 50.

Senator HUMPHREY. 5-0.

Mr. DEAN. Yes.

Senator HUMPHREY. Am I correct in my understanding that TVA has resisted, over the years, suggestions that an office of an inspector general be created?

Mr. DEAN. There have been suggestions like that made. The Tennessee Valley Authority has resorted to other means of establishing internal control. We have created such a good set of checks and balances within the agency, including the use of outside auditors, there has been very little mention of inspectors general in recent years, Mr. Chairman.

Senator HUMPHREY. You have no internal independent office that conducts audits on an ongoing basis?

Mr. DEAN. We have an Office of Audit and Evaluation which operates directly under the TVA Board. In other words, it reports its findings directly to the Board of Directors.

We have that group, in addition to the GAO, which regularly reviews certain parts of TVA's operation, in addition to a commercial auditor that examines our books. So we have several internal checks and balances.

To tell you the truth, I haven't heard anything mentioned recently about an internal inspector general.

Senator HUMPHREY. You say you have some office that functions in a certain way that serves the Board?

Mr. DEAN. Reports to the Board of Directors.

Senator HUMPHREY. What is that office?

Mr. DEAN. The Office of Audit and Evaluation.

Senator HUMPHREY. And that reports directly to the Board. Are they employees of TVA?

Mr. DEAN. They are TVA employees, yes, sir. They are to operate independently.

Senator HUMPHREY. Yes.

Mr. DEAN. They investigate any number of things.

Senator HUMPHREY. That is a full-time function?

Mr. DEAN. Yes, sir.

Senator HUMPHREY. How many members are in that office?

Mr. DEAN. About 50.

Senator HUMPHREY. I understand that one of the matters of particular concern these days is the proposed 9-percent increase in electricity rates to residential users. Is that figure correct, 9 percent?

Mr. DEAN. We do not have that figure, Mr. Chairman. The power people are supposed to come to us next week, at an open Board meeting, and present their rate recommendations.

I can assure you that I have not seen those numbers yet. Staff is still crunching them out in Chattanooga. The power people will come to the Board, in an open meeting in July, and present their recommendation and then we ask for public comments for a period of at least a month before we take final action.

If anybody has any questions about the numbers that are laid out there, it is all done right there in the Board room, where the public, of course, is invited and participates. But we have not, truly not, seen those numbers; and I cannot give them to you at this time.

Senator HUMPHREY. Are you saying then that there will be no rate increase?

Mr. DEAN. No, sir. I expect there will be an increase.

Senator HUMPHREY. So an increase is contemplated?

Mr. DEAN. We have had 3 years with no rate increase at all and this year we have had a rather poor hydro year and various other things that led us to believe there will be an increase this fall. It will be effective in October; but as I say, the numbers I do not yet have.

Senator HUMPHREY. Some of the newspapers down there quoted a figure of 6 to 9 percent. Is that ball park?

Mr. DEAN. We are required to put some figure in our budget as an estimate. I believe that is where that came from.

Senator HUMPHREY. 6 to 9 percent.

Mr. FREEMAN. The precise source of that is from a statement in our budget that it would not be more than 9. I don't know about the 6 percent.

Senator HUMPHREY. All right. The Chairman emphasized that this increase would be the first in 3 years. Nevertheless, there have been substantial increases, have there not, in the last 10 to 12 years?

Mr. DEAN. During the time when the Nuclear Construction Program was going full blast, TVA was borrowing at the rate of as much as \$2 billion a year and the interest on that money each year would become a part of the next year's rate base.

Of course, you know what happened to interest back in those days. A combination of the interest going up and the increase in prices of things like coal, led to some rapid increases in the rates.

Senator HUMPHREY. Well, we are going to get to the causes.

Mr. DEAN. All right.

Senator HUMPHREY. I just want to establish, you are anticipating a rate increase this fall somewhere between 6 and 9 percent?

Mr. FREEMAN. No, not higher than 9.

Mr. DEAN. No, sir.

Senator HUMPHREY. I don't think that will reassure your rate-payers. But in any case, not more than 9.

Mr. DEAN. We would rather not have any.

Senator HUMPHREY. It is correct that in 10 of the last 14 years, that is through 1984, since 1970, TVA has raised its residential rates in 10 of the last 14 years?

Mr. DEAN. They started with their first major increase in 1970. I was a power distributor then. From 1973 to 1981, there were, in fact, an increase in each of those years, to the best of my knowledge, about 8 straight years.

Senator HUMPHREY. We have a chart from one of your own publications that shows in 1971 rates began to rise and rose that year 13 percent. In 1976 it went up 22 percent; in 1981, 15 percent; in 1982, 11; and then 2 years without a raise; and now one coming up in 1986.

During that time, in real terms, the residential rates have doubled. Today, to be sure, they are below the national average. But then, TVA has some advantages that most utilities don't have.

For instance, hydropower, which is 13, 14 percent of your generating capacity?

Mr. DEAN. It is about one-sixth of our installed capacity. How many kilowatt hours we get out of it depends on how much rain we get.

Mr. FREEMAN. That is about average for all utilities in the country.

Senator HUMPHREY. And furthermore, something that no other utilities have is the Federal Financing Bank, is that correct?

Mr. DEAN. That is correct, sir. We used to issue bonds on Wall Street and at the request of the U.S. Treasury, we started borrowing money through the FFB.

Senator HUMPHREY. They didn't have to twist TVA's arm.

Mr. DEAN. I wasn't there, to be honest with you, Mr. Chairman.

Senator HUMPHREY. Let me make clear, for my understanding, none of us here are totally responsible, or even in large measure responsible. None of this is personal.

Mr. DEAN. It has been a good arrangement.

Mr. FREEMAN. For both the Treasury and for TVA.

Senator HUMPHREY. I am going to come back to this when my turn comes around next time and see if we can discover the reasons that these rates are continuing to go up.

Senator LAUTENBERG.

Senator LAUTENBERG. I yield to Senator Stennis.

Senator HUMPHREY. Senator Stennis.

Senator STENNIS. Thank you, Mr. Chairman. I will be back in the morning.

Senator HUMPHREY. Senator Lautenberg.

Senator LAUTENBERG. Gentlemen, we had some warm welcoming statements and I continue in that vein. The fact that you are represented by a distinguished Senator, that doesn't, nevertheless, preclude people from this side of the table from asking questions and from examining some of the problems that are there. Obviously, everything isn't perfect, contrary to Senator Sasser's statement.

But in any event, some of the things that I am concerned about include material that I have read that says that there is—I don't know if there is a morale problem, but there are certainly people who are concerned about the way the agency is operating.

Sometimes it has gotten out; things like the chairman's question about the inspector general. I just want to ask you this: Are you the only three Board members?

Mr. DEAN. Yes, sir.

Senator LAUTENBERG. How often do you meet, formally?

Mr. DEAN. Twice a month, normally. It could be more.

Senator LAUTENBERG. Are they executive session meetings?

Mr. DEAN. They are public meetings. They have to be announced according to the Sunshine law, well ahead of time, with the agenda.

Senator LAUTENBERG. So the entire meeting is open to the public?

Mr. DEAN. Yes, sir.

Senator LAUTENBERG. Do you feel that you are sufficiently covered then, in terms of any problems within the organization, by your internal department on audit control or whatever you call it?

Mr. DEAN. Audit and Evaluation.

Senator LAUTENBERG. Audit and Evaluation.

Mr. DEAN. Yes, sir.

Senator LAUTENBERG. Does that Audit Department do financial statements as well, or is that an independent auditor within? Do you have an independent auditor within your structure?

Mr. FREEMAN. We have an internal audit organization which is very much like that which a traditional corporation would have. It consists of about 40 professionals.

In addition, we have a program evaluation and management improvement function also carried out by the audit and evaluation group, which again, some corporations also have.

Those two have autonomy and can roam at will throughout the agency at their initiative. Their work, in turn, is reviewed by our outside auditor. The way that works is they review our internal audit procedures and very often—as often as not—there are some suggestions that we then take or do not take.

In each case we have accepted their suggestions as a way of concluding our audit. We have, I think, as fine a record—in terms of the kinds of things that the inspector general is supposed to be worrying about, we have a very fine record. It works quite well.

Senator LAUTENBERG. Mr. Freeman, you, in particular, as I read your statement, talked about making certain when you left this agency—I think you have two years left.

Mr. FREEMAN. Yes.

Senator LAUTENBERG. That you would leave it—I think you said, “I am not going to leave with this on my record.” You talked about the problem with the nuclear facility.

It has been suggested by the NRC that, I quote here, “There were performance deficiencies at the TVA facilities indicated by consistent poor performance.”

An inspector general could be there, if the management isn't, to make sure things are run properly and to hear complaints. We are dealing with not only an energy source but an issue of critical concern in terms of the safety of the people in the surrounding areas.

While you have a proud record at TVA to talk about, there isn't a corporation or organization in the country that doesn't have problems. You are not here simply to present your laurels based on the authorization that you seek.

You are a public agency, there is a lot of attention going your way. Therefore, you are going to be asked about the things that give you trouble. Does the Audit and Evaluation group evaluate

the way financial statements are drawn or do they evaluate some of the functioning disabilities that we find?

Mr. DEAN. The Audit and Evaluation group evaluates not only the traditional finances but also operating matters. But in addition to that, we have a nuclear safety review staff, which deals only with our nuclear operation, that reports directly to us, the board, as well.

It was that staff that identified many of the problems that caused us voluntarily to shut down Brown's Ferry. We were not satisfied with the plant's performance. Not only was the NRC not satisfied, we were not satisfied.

We had identified the problems. We thought we could solve those problems while we had the units on line. We did not make enough progress over the last year. For that reason, we shut it down.

We also have a very severe problem of not having enough competent managers to handle all of the operating plants. We have addressed this issue to the chairman of this committee. TVA is continuing to examine that question as well.

We need to be able to go outside to attract additional managers.

Senator LAUTENBERG. What are the constraints in terms of salaries?

Mr. FREEMAN. The constraint is that no employee can be paid a salary in excess of the board of directors, which is \$72,000.

Senator LAUTENBERG. We are in the same fix. We have the same salary. But the fact of the matter is, it is hard to get this kind of talent for \$72,000 a year. Don't you agree, Mr. Chairman?

Senator HUMPHREY. As public servants.

Mr. DEAN. I would like to emphasize that we are not trying to get anything for ourselves.

Senator LAUTENBERG. But maybe if there was some way of not fixing that to your salaries.

My time is up, I am reminded by the chairman.

Senator HUMPHREY. Is that not one of the few Grace Commission recommendations on which the Authority has already acted?

Mr. DEAN. The TVA has acted on every Grace Commission recommendation with the exception of raising more money from the fertilizer industry for fertilizer research.

Senator HUMPHREY. All right.

Mr. DEAN. They did make a recommendation about the pay but, of course, we have been unable to act on it. We have mentioned it to Congress several times. We have brought it up again recently, this time with the support of the NRC as well.

Senator HUMPHREY. All right. That is another area which we want to explore in detail.

It is my understanding there are a number of things which you haven't yet followed.

Mr. FREEMAN. I hope we will be able to deal with that.

Senator HUMPHREY. You bet.

Senator Burdick.

Senator BURDICK. Thank you, Mr. Chairman. My question is addressed to the panel. You can answer it in any way you can. According to OMB, the seven-State TVA region has eliminated the economic disparity between it and the Nation as a whole and no longer justifies additional regional funding.

What is the average per capita income in the valley and are these seven States experiencing economic problems above and beyond the other 43 States?

Mr. DEAN. Mr. Waters mentioned that, Senator Burdick.

Mr. WATERS. Senator, I think I referred to that in my testimony. We have a chart here which may help.

Actually, we deviate still below the national average by any measure—per capita income or in Federal contributions. On the basis of per capita income, we in the valley are now 77 percent of the national average.

I think you will find this chart here refers to this. This one refers to Federal spending. It shows that we are under the average in the valley, even counting TVA funds of Federal spending based on the national average.

We, as I stated, only have about 77 percent, at the last calculation, of per capita income in the valley. We have unemployment right now of about 9½ percent.

Senator BURDICK. OMB states that:

To the intent direct Federal assistance is warranted, it can be provided more equitably by programs administered nationally by other Federal agencies.

This statement implies that TVA's program either duplicates or competes with other Federal programs. Please comment on the accuracy of this OMB statement.

Mr. DEAN. We are very proud of the fact that the bulk of the programs that we are involved in are not TVA-only programs. We support other agencies, and quite often, educational institutions.

A good example would be our work in soil conservation in the western part of our system where we have had severe erosion in recent years. We have worked with the SCS and other major agriculture agencies to try to fight that problem. We haven't done it by ourselves. We have worked in a cooperative stance.

Certainly, fertilizer research is a classic example where we have worked with SCS and other programs. We stress the fact that we don't want overlap in our programs and we try for cooperation.

Senator BURDICK. Assuming your answer is the joint programs, in TVA's appropriated budget, how many programs require additional funding in other Federal agencies' budgets?

Have these agencies objected to OMB's budget cuts and are they prepared to pick up total costs in their own budgets?

Mr. DEAN. No, sir, they are not prepared to pick up the total cost in other budgets. A good example would be the Land Between the Lakes, which is a large area that TVA is custodian of and uses for many kinds of things. It is in west Tennessee and Kentucky.

Of course, that has been lined out of the budget and, as far as we know, there is nobody that has indicated the slightest ability or desire to take over that extensive operation. That is an example. It is hanging out there now.

Senator BURDICK. OMB has requested a 73-percent reduction in TVA's request for the National Fertilizer Development Program. I will have more direct questions on the Fertilizer Program, but I was wondering why OMB wants to reduce the program. Does this request contradict the findings of the Grace Commission?

Second, why did OMB drop the September 1984 joint TVA/OMB and White House agreement to study ways of making the fertilizer industry self-supporting?

Mr. FREEMAN. There are two parts to the answer to that question. One is historical and the other is philosophical. As I understand the philosophy of OMB, it is that not just TVA's Fertilizer Development Program, but all research conducted by the Government should stop at the laboratory.

TVA uses a transfer mechanism that gets the results out of the laboratory to the plants of industry. That is what has made the program work so well.

It is contrary to the philosophy of this administration and the OMB, who feel that the Federal Government should not be doing that. I can only say it has worked beautifully for the American taxpayer and certainly for the American consumer of agriculture products.

The Grace Commission similarly felt that the Federal Government should not be involved in work beyond the laboratory. They did, however, suggest there should be a phaseout over a period of years. It was that agreement that had been worked out with OMB which OMB would not fund.

Senator BURDICK. OMB recommended no funding for the approximate 170,000 acres of Land Between the Lakes natural resources demonstration area. If no funding is provided, what does OMB propose to do with the land?

Mr. DEAN. That was the piece of land that I was referring to that is used for a combination of recreation and environmental demonstration. There is no proposal. It is just hanging there now.

Mr. FREEMAN. In the Interior Department the Park Service would have been such an agency. The Interior Department decided long ago that the LBL project should be run by the Tennessee Valley Authority.

They have no intention of taking it over. There is no proposal at this stage on anybody's part to deal with that problem.

Senator BURDICK. My time is up. I will ask the rest of these questions later.

Senator HUMPHREY. Does the Senator from Tennessee wish to tender a statement?

Senator SASSER. Mr. Chairman, we are going to be here tomorrow to testify. For my part, I wouldn't impinge on the subcommittee's good nature to ask questions.

Senator HUMPHREY. We are looking forward to your testimony. Senator Gore.

Senator GORE. I have a conflict between my sense of politeness to the chairman and my eagerness to jump into this discussion.

But I sense that the chairman really would prefer that we not interfere with the subcommittee's moving forward now. So I will just make a note of the things I want to get to and I will get to them tomorrow. Thank you.

Senator HUMPHREY. Thank you.

Senator Stennis.

Senator STENNIS. I have nothing at this time, sir.

Senator HUMPHREY. Mr. Dean, I want to return to the Office of Evaluation. According to this chart, if it is up to date, the Office of

Audit and Evaluation seems to report to the Office of General Counsel, or perhaps dually to the Office of General Counsel and the Board of Directors.

Mr. DEAN. It reports to the Office of General Manager for administrative purposes but to the Board of Directors for all reports. Any report they file goes directly to the Board of Directors.

Senator HUMPHREY. How independent is this Office of Audit and Evaluation?

Mr. DEAN. Absolutely, totally independent. They don't answer to anybody.

Senator HUMPHREY. Can the General Manager hire and fire people in that office?

Mr. DEAN. Not without checking with the Board.

Mr. FREEMAN. He cannot, that's right.

Senator HUMPHREY. That is a definitive "no"?

Mr. FREEMAN. That is a definitive "no".

Senator HUMPHREY. But the Board can?

Mr. DEAN. We can dismiss anyone, sir, with cause.

Senator HUMPHREY. Does the General Manager recommend? How strong is the influence of the General Manager in the hiring and firing of people in this office?

Mr. DEAN. Normally, Mr. Hulme, the manager of this office, is responsible for gathering his own team. The General Manager is most unlikely to make any recommendation to Mr. Hulme.

Senator HUMPHREY. Mr. Hulme is the chief officer?

Mr. DEAN. Yes, sir.

Senator HUMPHREY. Right?

Mr. DEAN. Yes, sir. He puts together his own team.

Senator HUMPHREY. Who is the head? What is his title at the office?

Mr. DEAN. The head of the Office of Audit and Evaluation is Doug Hulme.

Senator HUMPHREY. How long has he been in that position?

Mr. FREEMAN. Three years.

Mr. DEAN. Three years.

Senator HUMPHREY. Did his predecessor leave? What was the circumstance of his predecessor departing?

Mr. FREEMAN. We created this as a new office, and replaced the traditional kind of audit function that we had talked about. The outside auditor advised us and helped us to establish this kind of an organization.

Senator HUMPHREY. We recently established—by statute, I believe—a truly independent Office of Inspector General within the Pentagon. Perhaps something along those lines might be something that we want to look into. We will pursue that at a later date.

Now, getting back to the matter of the Office of Information, what is the purpose of the Washington office? Is that an information office?

Mr. DEAN. No, sir. They serve as a liaison between the agency and the various Government offices and the legislative branch up here on the Hill. TVA is the only major Federal operation which does not have its headquarters located in Washington.

Senator HUMPHREY. That is a point in your favor.

Mr. DEAN. Yes, sir. I certainly hope nobody ever gives that a long, hard look. We are happy in Knoxville. But as you might well imagine, we have many relationships with the House and Senate and the various committees and Government agencies.

The people we have in Washington—that is their job, to maintain that relationship and keep the information flowing back and forth.

Senator HUMPHREY. How many people are in that office? About 13?

Mr. DEAN. Thirteen.

Senator HUMPHREY. With respect to information offices, the office of General Management is not an information office, is that correct?

Mr. DEAN. There is one information office for TVA.

Senator HUMPHREY. That is the main office?

Mr. DEAN. Yes, sir. The Washington office doesn't have its own information office. There is just one. They look after the whole show.

The one that I said had 50 people in it have various and sundry things under them, including all publications. They have the citizen action line, which is a toll-free line where people can call and ask any kind of question they want to. They can file any kind of complaint they want to.

In fact, each of the directors works an hour every month or so, so we can maintain contact. But they run all of that. We have many visitors from all over the world, all the time.

Senator HUMPHREY. There are 50 people in the main information office now?

Mr. DEAN. That is all over.

Senator HUMPHREY. Is there also an information office in the corporate administration planning?

Mr. DEAN. We just have that one information office. That is all, the one we are talking about.

Senator HUMPHREY. There is no other information office?

Mr. DEAN. No, sir. We have a branch that still reports to the one in Knoxville.

Senator HUMPHREY. What about the fertilizer operation? Does that have an Office of Information?

Mr. FREEMAN. That is still within the 50 number. All report to the Office of Information. Each office has a person assigned who is a specialist in that activity. They are all part of and included in the number.

Mr. DEAN. The fertilizer people put out a vast amount of publications.

Senator HUMPHREY. I sometimes think that the Office of Information is putting out some fertilizer, frankly. We will work our way through this.

Let's go back to the increase in electric rates. Once you decided whether you need to do it or not, how do you determine how much you are going to raise the rates?

Will you be submitting the proposed increase to the public utility commissions in the various states?

Mr. DEAN. No, sir. The way TVA is structured, the TVA Board determines the rate we charge for power.

Senator HUMPHREY. I see.

Mr. DEAN. The power staff will submit to the Board a proposal. We will take at least a month to allow for public comment. If anybody has reason to doubt our economic projections or sales projections or figures that we are using for coal purchase prices, uranium prices, labor prices, all the things that we have to pay for to generate power, if anybody has questions about those, we welcome and solicit their comments.

We take all that into account. Sometime in late August, we make our decision.

Senator HUMPHREY. So by and large you don't have to submit your rate increase, or decrease for that matter, to anybody?

Mr. DEAN. That's correct.

Senator HUMPHREY. You are both the regulated and the regulator?

Mr. DEAN. That's correct; the Board sets the rates at which electricity is sold.

Senator HUMPHREY. That is a pretty good deal.

Mr. DEAN. Well, we don't have any stockholders except our ratepayers.

Senator HUMPHREY. Maybe that is the problem.

Mr. DEAN. The ratepayers are our stockholders. They own the system.

Mr. FREEMAN. The ratepayers and the taxpayers of the United States.

Mr. DEAN. Right.

Senator HUMPHREY. I guess that makes us the Public Utilities Commission.

All right. I was aware of all that. I simply want to establish for anybody that might be listening that the Tennessee Valley Authority determines, on its own, what it should charge, subject to review by nobody.

That is unique only to the Tennessee Valley Authority, of all of the utilities in the United States, as far as I know. TVA is the largest of those utilities.

That is inherently dangerous, in my view. Something ought to be done about that because I would think by now, if you were a ratepayer, a residential ratepayer in the TVA region, I would be wondering about those initials, "TVA."

After all of these rate increases and a prospect of not greater than a 9-percent increase next year, I would be wondering if maybe those initials don't stand for Tennessee Vampire Authority. I mean, this is a closed deal. It is really outrageous and goes against the grain of American fairness.

Mr. DEAN. Mr. Chairman——

Senator HUMPHREY. Let me finish. I think people of the Tennessee Valley region deserve better. I think they need a champion.

Now, once upon a time TVA might have been that champion. But in my view, it is no longer. I have heard it referred to as a benevolent dictator. I think the benevolence is now beginning to disappear.

I think the people of the region deserve a champion. And I think all of us here, and all of us in Congress, irrespective of what State you might represent, could be that champion. That is one of the

things that I want us to pursue. I have already used up all my time.

Senator LAUTENBERG. I might differ with the characterization of TVA with my respected and distinguished Chairman, because as far as the shareholders, the rate payers, they haven't been doing so bad. The electric power rates are pretty good down there. Residential power rates are among the lowest in the country.

Is that correct?

Mr. DEAN. That is what I was getting ready to say, and incidentally, there are other electricity suppliers whose rates are not regulated.

Senator LAUTENBERG. I will take over, Mr. Dean. I will help you through this.

Mr. DEAN. Excuse me, sir. I was going to say, even after adjustments, it is still among the very lowest in the United States.

Senator LAUTENBERG. Which rankles me, because we, in New Jersey, have very high ratepayers. We have a problem that we have to share as a Nation.

I was in the private sector before I moved here. I enjoy my service here very, very much. But there are distinct disadvantages. One is that everything you say or do is public.

I was also Commissioner of the Port Authority of New York and New Jersey and I am very familiar with transportation. I managed a large company therefore I have some idea of organizational structure.

How big is TVA? What are the revenues?

Mr. DEAN. The power revenues, of course, are the biggest part of it. It is \$4.5 billion a year. We have 33,000 employees scattered over seven States. We are a pretty large corporation. We are, in fact, a corporation.

Senator LAUTENBERG. There is a three-person Board of Directors?

Mr. DEAN. That's correct. It is really more a three-headed chief executive officer.

Senator LAUTENBERG. That has got to present a problem.

Mr. DEAN. Sir?

Senator LAUTENBERG. Three diverse minds trying to decide one course of action.

Mr. DEAN. It is amazing, we all come to the same place.

Senator LAUTENBERG. Now, are these full-time positions?

Mr. DEAN. Yes, sir. The TVA Act provides that no member of the board can engage in any other business.

Senator LAUTENBERG. So your meetings are simply the formal meetings which are available to the public?

Mr. DEAN. A lot of times we travel. We have briefings from the staff, trying to keep us up to date on various projects.

Senator LAUTENBERG. Each has a full-time commitment?

Mr. FREEMAN. We have regular briefings with the staff in which we receive the kind of information that a chief executive would need in order to make decisions.

Senator LAUTENBERG. Is that a cumbersome system?

Mr. FREEMAN. It has worked quite well.

Senator LAUTENBERG. It is full time?

Mr. DEAN. Yes, sir. Absolutely, full time; 33,000 employees are a lot of employees. Yes, sir.

Senator LAUTENBERG. Do you divide the portfolios?

Mr. DEAN. No, sir. We do not divide the portfolios.

Senator LAUTENBERG. One of the problems we had when I was on the Port Authority Commission—there were 12 public members, nonpaid—was to try to elevate the professional management salaries beyond that of the executive director. He was very amenable to that. We had to fight for that in order to get the right kind of talent.

This is one of the things that Mr. Waters had talked about, the spending on a per capita basis. Of course, that goes to more specific projects; because yours may be confined to one thing. You referenced mass transit in your comments.

We started talking about service for projects, for programs, perhaps small numbers of people; but when you divide up the total problems, it may be modest. But it does look modest when you are looking for the appropriations. This year it is \$140 million, is that your request?

Mr. FREEMAN. Our request was \$130 million.

Senator LAUTENBERG. \$130 million? What happens to the roughly \$190 million shortfall? You don't close shop, do you?

Mr. DEAN. No. We have hopes, Senator, that in the processes that go on up here, that quite a bit of that might be restored. Senator Stennis told me, not long ago, he said, "Be patient. It takes time."

Senator LAUTENBERG. He told me the same thing when I came here 2 years ago. So far he has been right.

Mr. DEAN. We found it to be very desirable to listen to Senator Stennis. So we are being patient right now.

Senator LAUTENBERG. So the programs that we are talking about, are not programs that would crimp the functioning capability of the TVA, obviously.

I mean, we have talked about you having \$4.5 billion, plus. You have \$4.5 billion on the power side alone. What are the other numbers?

Mr. DEAN. The power side has to stand on its own two feet, Senator. In other words, that is a separate operation. It has its own borrowing authority. It is separated completely. It is the one that is paying back to the Treasury the initial Federal investment with interest.

The appropriated programs, which include the natural resources and economic development programs, is the other side of the agency. That, of course, could not do very well at a level of \$38 million.

Mr. FREEMAN. It was contemplated by OMB that that would abolish most of the programs that we have been talking about, other than power.

Senator LAUTENBERG. But you all feel that those programs are important, I think you stated more important than simply regional problems.

Mr. DEAN. Yes, sir.

Senator LAUTENBERG. I wonder why it is that other than structure, which of course, you can always modify, that the fundings for these projects can't be financed out of the power side of things?

Perhaps rates are too modest. After all, TVA was created 50 years ago to address severe problems in the Tennessee Valley region. Are the problems still so severe that they warrant this special Federal economic development?

Mr. DEAN. Well, sir, let me give you an example. Certain parts of our operations, such as industrial development of the type that are funded by utilities such as the one in your area, do get money from the power side of the operation.

But, when you get into something like, say, operating the Land Between the Lakes, or the Fertilizer Development Center, these are not the types of things that you could expect the ratepayers to have a need for or any interest in.

In essence, it is a national function. The money that we spend on operating the river system, for instance, is not a thing that ratepayers should pay for. It would be done by the Army Corps of Engineers using appropriated funds if we were in a different part of the country.

So those are the types of things that just simply would not lend themselves to being unloaded, so to speak, on the power ratepayers.

Senator LAUTENBERG. On the other hand, you can't, Mr. Dean, escape the fact that you three are responsible for all the phases of the Authority's jurisdiction, correct?

Mr. DEAN. Yes, sir.

Senator LAUTENBERG. Here we have ratepayers funding coming in on one side, perceived to be subsidized by many of us outside your region. That doesn't come as a surprise to you, does it?

Mr. DEAN. No, sir, that is why we tried so hard to point out that we weren't being unfairly subsidized.

Mr. FREEMAN. In the early part of the testimony, we explained the financing of the power system. It does indeed stand on its own feet. It is not subsidized by the taxpayers of the United States.

Senator LAUTENBERG. What I guess I am responding to is—and though I missed the testimony, I am certainly aware of it—the fact that maybe the rates ought to be more fairly adjusted to the rates that people are paying throughout the country.

If it requires that that structure exist, maybe we ought to change the legislation in some way to say, "OK, the rates for electric power are normal for the region." Then maybe what we do, on the other hand, is to guarantee that it goes back in some way into the jobs and research market.

Mr. DEAN. It would be hard for us to say, for one thing, Senator, what normal rates would be. We have had some aluminum industry people complaining to us that the public authority in New York City had better rates than we had for certain kinds of power. In different parts of the country there are different rates for different size industries.

Senator LAUTENBERG. I am past my time here.

Mr. FREEMAN. To deal with this in statutory terms, we are required to charge rates at the lowest feasible level. That means a cost-based rate structure.

So we look ahead, as the Chairman explained, each year, to try to project our cost and then we must cover this cost. Under bond covenants and other legal instruments, we must cover those costs.

We must do so in a way that will leave power rates at the lowest feasible level.

Under our statute, and indeed the bond covenants—I think it would be safe to say that there are many expenditures that we have been talking about that we could not legally, consistent with those covenants with the holders of the bonds, we could not legally finance.

Senator LAUTENBERG. We would have to then, examine in very close detail the proportionment of overhead.

Mr. FREEMAN. That's correct.

Senator LAUTENBERG. My time is up. I am sorry, Mr. Chairman. Senator HUMPHREY. Senator Burdick.

Senator BURDICK. Mr. Chairman, if my time runs out before I ask all my questions, I will submit the balance to be answered in writing, and ask unanimous consent that they be made part of the record.

Senator HUMPHREY. Without objection.

Senator BURDICK. Please address in some detail past Federal investments in the power system and how these are presently being paid back to the Federal Treasury.

Mr. FREEMAN. The original investment in the power system was \$1.2 billion. Under the repayment provision in the 1959 statute, we have repaid a little over \$400 million.

There is now invested in the system through reinvested earnings and the Federal investment is about \$2.5 billion. But the taxpayers' part is now only about \$850 million.

We have paid back each year now at the rate of \$20 million a year, under our statute, with interest or dividends, as you wish—you can call it what you want to call it; at the then current rate of the government's cost of money, its average rate over the prior year. All issues of debt have run recently, currently, over 10 percent. It has been as high, of course, as 12 percent.

This is a unique arrangement. There is no other Federal power generating installation in the United States that pays on the basis of the current cost of money. Most of the Federal investments in power systems around the United States are repaid at the rate of the borrowing at the time that the borrowing or appropriation took place.

Of course, given the history of interest rates, it was much, much lower for the rest of the federally owned utilities.

Mr. DEAN. I think last year TVA paid \$113 million.

Senator BURDICK. The claim has often been made that TVA power rates are, in effect subsidized, due to the Federal investment in the power system prior to 1959. Please address this claim, if you will?

Mr. DEAN. In 1959 the law was passed that enabled TVA to issue bonds. At the same time it directed TVA to make the payments just referred to, to the Treasury with current interest, whatever interest rate the Federal Government was paying at that time.

Therefore, there is no subsidy left in the system whatsoever.

Senator BURDICK. Is the power system subsidized by its use of low interest rates from the Federal financing bank?

Mr. DEAN. We borrow money through FFB, as I said earlier. At initial request of the U.S. Treasury, we paid them a slight premi-

um of one-eighth of a point, as I remember, on what they have to pay on a given day.

It is speculative what we would have to pay on Wall Street. I would think that maybe we have a little advantage.

Mr. FREEMAN. But interestingly, our fee, one-eighth of one percent, exceeds Treasury's cost of issuance. The taxpayer is making a little money on the issue. As I said earlier, it is good for TVA's ratepayers. It is also good for the Treasury.

Senator BURDICK. It is my understanding that TVA has implemented several programs which have curbed the need for further plant expansion. Please describe the interruptible power rate plan and programs to help the average resident reduce his or her monthly electric bills.

Mr. DEAN. We have two programs. You mentioned the interruptible plan as the first of the plans we have for larger industries. They can vary their load, depending on what time of the day or even what time of the year we have available for seasonably priced power.

That is one plan that has helped our industries stay in the valley and prosper there.

For individuals, we have plans that involve loaning money to people that have installed certain measures such as insulation and storm windows and that type of thing. It is designed to save them money and postpone the addition of generating facilities to the system.

Senator BURDICK. Mr. Chairman, the balance of my questions are non-power-related questions and will be submitted and answered in their due time.

Senator HUMPHREY. Thank you, Senator.

Returning to the subject of rate increases, looking out beyond 1985, have you made any projections? It seems to me that I read somewhere, in your annual report or somewhere, some projections about necessary increases in rates in the out years. Can you talk about that?

Mr. DEAN. We have consistently said that we would like to be able to hold—and we expect to be able to hold—our rate increases, looked at over the years, to approximately what the rate of inflation is.

Senator HUMPHREY. In other words, you do not expect your costs to exceed the rate of inflation?

Mr. DEAN. Overall. By that I mean we might have some years we would be able to beat that. We might have other years where we might be slightly over. But we would be in that ball park. We are striving to do that.

Senator HUMPHREY. You were quoted by one of the newspapers as considering, at least as one of a number of options, contracting out the operation of TVA's nuclear generating facilities. That is from the Knoxville Journal of July 10. You mentioned that you had seen that story.

Is that pretty accurate?

Mr. DEAN. I am glad to have a chance to comment on that, Mr. Chairman. The reporter asked me a direct question, "Have you considered contracting plants out?" My answer was, "That has to be on a list."

However, let me make it clear that the Board of Directors has not made any serious consideration of such an operation. We have not had any urge to do that whatsoever.

Senator HUMPHREY. You have not taken it seriously?

Mr. DEAN. That's correct.

Senator HUMPHREY. No consideration?

Mr. DEAN. That's correct.

Senator HUMPHREY. Have you given it any consideration at all?

Mr. DEAN. We planned on solving the problem without doing anything like that.

Senator HUMPHREY. You have not considered this option?

Mr. DEAN. No, sir, I say it had to be on our list somewhere, but that doesn't mean it has to be considered.

Senator HUMPHREY. Why does it have to be on the list?

Mr. DEAN. Because there are just so many options, sir, that you can engage in, when you own a series of any kind of plants. You can shut them down. You can fix the problem.

Senator HUMPHREY. This is a special kind of option. It certainly implies a lack of in-house capability or faith or both.

Mr. DEAN. We think we can handle the thing in-house. We have asked for some help from Congress, for some help with our pay cap problem. That is part of our problem.

Senator HUMPHREY. The record of TVA, going back quite some time in this area of constructing and operating nuclear powerplants, is not stellar.

You have expressed concern with the record of TVA on this point. Apart from the operation, let's go farther back to the decisions that precede all of you, I am sure, to decisions about entering into the nuclear field.

TVA had originally committed to build or planned to build 17 nuclear power generating plants.

Mr. DEAN. For a long time there were 17 units, at 7 plants on the drawing boards.

Senator HUMPHREY. Seventeen. You have five that have operational licenses?

Mr. DEAN. That's correct.

Senator HUMPHREY. Three of the five are shut down?

Mr. DEAN. Yes, sir.

Senator HUMPHREY. You have four under construction?

Mr. DEAN. Yes, sir.

Senator HUMPHREY. You have canceled eight?

Mr. DEAN. That's correct.

Senator HUMPHREY. Out of the 17, you have 2 that are working?

Mr. DEAN. Today, we have two that are running. In addition, we have three that have run. They are shut down.

Senator HUMPHREY. With no date for Brown's Ferry?

Mr. DEAN. No, sir, we just reorganized our nuclear operation. We put in Mr. Parris, who is our most competent power executives over the nuclear part of the operation.

That has only happened very recently. It will probably take him a while to assess the situation at Brown's Ferry and come to a recommendation as to when it should be restarted.

Senator HUMPHREY. The Nuclear Regulatory Commission has not been enthralled on TVA's performance on this point. They made

the criticism that TVA has experienced "a sustained and consistent history of poor performance in its nuclear program."

Do you agree with that?

Mr. DEAN. Not entirely, sir. The rating we got on our Sequoyah Nuclear Plant, which is the one that I said was running, was above average. That is from the NRC. We feel like that plant is in pretty good shape.

Our problems are more or less centered around our Brown's Ferry Nuclear Plant, which is one of the older plants in the country. And to tell you the honest truth, we have been trying to bring it up to snuff, to rebuild it, while at the same time operate it, which, again, has caused some problems.

Senator HUMPHREY. Are you saying that you disagree with the NRC's characterization?

Mr. DEAN. I am not here to get into any public disagreement with the NRC, sir.

Senator HUMPHREY. Well, that is pretty serious, when you consider the nature of nuclear power. I am not going to rehash the 1975 disaster. I think you are aware of that. I cite that only as a way of underscoring the peculiar nature of nuclear power.

TVA has been charged by the NRC with a record of sustained and poor performance. That is a pretty damaging situation, I would think. You acknowledge there are some problems. What is the fundamental underlying cause of these problems?

Mr. DEAN. Well, it is various things. We have had too much turnover in our nuclear management. As I said earlier, we tried to make over a plant and rebuild it in accordance with modern conditions and continue to operate at the same time.

There are other problems we have to target and correct as time goes on. We certainly share NRC's concern. Their primary interest is in seeing that we operate a safe system. So we are all pointing in the same direction. Working together, we think we can get there.

Senator HUMPHREY. I think you said earlier that part of the problem is turnover.

Mr. DEAN. Yes, sir, we have lost some key people.

Senator HUMPHREY. Because of the pay cap?

Mr. DEAN. Yes, sir.

Senator HUMPHREY. Well, then, there is another fundamental problem inherent in the nature of TVA. It is one that depends not only on efficiency, but in the most important way, on the safety.

Mr. DEAN. It is very serious because when you train people in the nuclear business, they become invaluable, more so than in industry. In industry a good manager is quite often a good man. A man who runs a factory can be switched over and he can run a steel mill because he has certain traits of leadership and managerial skills.

But in nuclear, it is a very highly specialized field that involves dealing with complex regulations. It is not something that a person picks up quickly just because he is a manager. When he picks up these skills, they become quite valuable on the market. That is part of our problem.

Senator HUMPHREY. There is no question about that. But my only point is that there is a structural problem inherent in the nature of TVA. It is going to take a structural change to correct it.

Let's get back to the long-range planning of TVA. How was it that TVA so badly misjudged the demand growth of electricity in the sixties?

At that time TVA was projecting annual growth of 7 percent, when the actual increase in the sixties was a little over 4 percent. So that the sixties growth was 4 percent and TVA's projections were 7 percent growth, when in fact demand was only 2½ percent.

How did TVA miss the mark so widely, with ramifications that the ratepayers are beginning to see today?

Mr. DEAN. Actually, all the utilities in the United States were "guilty," if that is the word, of assuming that consumption of energy would continue to double every 8 to 10 years. Those were the going predictions.

In the early part of the seventies, oil shot up, prices shot up. The price of electricity went up. People started finding out how they could get along with less. The utilities, including TVA as one of the leaders, encouraged people to use less electricity.

There was a discovery of the fact that the economy was not coupled with the use of electricity, as we once thought. A combination of these things lowered the growth rates to a point where right now our high load growth projections are somewhere in the neighborhood of three percent a year.

That is our high end of it. It has only a chance of one in ten of it going there. It will be quite likely in the neighborhood of 2 percent or less.

What I am saying is that the entire utility industry woke up to the fact that they were assuming that the economy would grow on into the sky. Of course, that has not been the way it has been. The result of this is that the United States is dotted with canceled nuclear plants. And TVA is no exception.

Senator HUMPHREY. But TVA missed the mark by almost 50 percent. You planned 17; you canceled 8. You are the major utility in the country that has as bad a record as that?

Mr. DEAN. Well, sir, the Department of Energy, if they were drawing today the power that they told us that they would be drawing today, there would be four more reactors in service.

Senator HUMPHREY. Are you talking about the enrichment facility?

Mr. DEAN. Yes, sir.

Senator HUMPHREY. Did you not lose that business just recently for the reason we cautioned you that you might lose that business years ago, namely, that you are no longer competitive?

Mr. DEAN. They have only taken about 400 megawatts, sir. The balance of 4,000 more megawatts that they have contracted for, they didn't take. They were operating on the assumption a few years ago, in the early seventies, when they made the contracts with TVA, there would be something like 200 nuclear plants in service by now.

There are only about 75 or 80. They also assumed that nobody else could enrich uranium but the United States.

Senator HUMPHREY. You cite the fact that they are purchasing much less, which is true. The reason that they are purchasing much less is that they found utilities would sell them electricity at a lower cost. Is that correct?

Mr. DEAN. No, sir. They contracted with TVA in the late sixties and early seventies for increased blocks of power and what they would be drawing today would be 4,500 megawatts, if they were actually enriching the uranium that they thought they would be to serve the needs of the country.

When they shut down recently the Oak Ridge plant—which is what the Senator refers to—at that time they were only drawing about 400 megawatts for that operation.

Senator HUMPHREY. My time has expired.

Senator LAUTENBERG.

Senator LAUTENBERG. I know there isn't much you can do to change it for now, but just for my own information, to get it on the record, what are some of the things we can do to help you in your very serious responsibilities?

What do you think of the system of management? I recognize Mr. Dean is Chairman. The fact is that each of you is essentially a CEO.

Mr. DEAN. That's correct, yes, sir.

Senator LAUTENBERG. Who is responsible?

Mr. FREEMAN. The three of us are responsible and we feel that very seriously. It has worked.

Senator LAUTENBERG. I mean, somebody has to take the rap for the problems with your nuclear facilities.

Mr. FREEMAN. And we regularly do.

Senator LAUTENBERG. You all three share that?

Mr. FREEMAN. Yes.

Senator LAUTENBERG. Which one of you say, "I did my third of misjudging or missupervising?" I mean, the buck stops where? Everybody knows in a company there is a CEO that gets the bad charge. You don't have a Board of Directors, you say. Who fires you?

Mr. DEAN. Well, we can be relieved by a concurrent resolution of the House and Senate.

Senator LAUTENBERG. I think that is a very cumbersome process. I am not suggesting, by the way, that any one of you should be fired.

Mr. DEAN. Thank you, sir.

Senator LAUTENBERG. Obviously you can make more money doing other things. I am being very serious; who says, "OK, Dean, Freeman, and Waters, you are not doing such a good job." What do we do? Convene the two Houses?

Mr. FREEMAN. I would think if the Valley delegation or this committee were convinced that we were not doing a good job, it would not be difficult in getting a concurrent resolution.

Senator LAUTENBERG. You wouldn't like it if you were a shareholder or something like that.

Mr. FREEMAN. I, too, came from the private sector. I came from a structure that is unusual in the private sector which is not unlike the one we have. We had a three-person committee.

Senator LAUTENBERG. A father and two sons?

Mr. FREEMAN. No, as a matter of fact, it was not. We were an employee-owned railroad company. We were structured as TVA. It worked for the railroad.

Senator LAUTENBERG. I would submit that you have got an awful task. Here you have a situation that you collectively have described as difficult because you are unable to pay the kinds of wages that you think are competitive.

If you were cochairmen, co-CEO of X Airline, would you send a pilot out, knowing that he is not the best or he is not as trained as you would like him to be?

You say, "Listen, you have got to fly that 747 or DC-10." Each one of you sitting there saying, "I wish he didn't have to fly that airplane. Charley is the only guy we can afford, so what the hell."

Mr. DEAN. We certainly don't plan to use your analogy, to put a pilot in the plane. We will let the plane sit on the ground before we will put a pilot like that in.

Mr. FREEMAN. That is what we are doing at Brown's Ferry.

Senator LAUTENBERG. Well, I don't think that argument is sound. If the Brown's Ferry action is in response to criticism from an agency assigned oversight, then everything you do looks like it is defensive.

Mr. FREEMAN. We took that action before any actions of the NRC. We were as concerned or more concerned than the NRC.

Mr. DEAN. He is talking about Brown's Ferry.

Mr. FREEMAN. Brown's Ferry, yes.

Mr. WATERS. It is an unusual organization. I don't know anything like it anywhere else in the United States or abroad. I don't know that this Congress of the United States has ever created a Federal corporation that cooperated in this way. Obviously, they have not.

It was an experiment. There is no question about that. It was an experiment for a particular purpose, designed to create the flexibility of a private corporation with the authority of the Government to do the job set out in the act.

Now, the act is very specific. It does—it has a great deal of regulations on what we, as the Board, can do. For example, it was said a few minutes ago, we are very limited on what we can do with ratepayer's money, paid into TVA. The act specifies that.

The act also has very specific requirements on how we will set our rates. So, we are not just three people meeting and setting rates that we think ought to be applied without any control.

TVA has been probed by the Congress more than just about any other agency. TVA has been written about almost more than any other agency. It has been cussed and discussed by almost everybody, not only by people outside the valley, but by people inside the valley.

The only thing that we would like to ask you to sincerely do is to see how it works. If TVA can be improved, it is this group's authority and responsibility to do it. Certainly I would not deny that for 1 minute. I would ask you to see how this unique experiment has worked in the Tennessee Valley.

Senator LAUTENBERG. There is a lot of tolerance. So I would have to tell you that there is a lot of tolerance in cost of funding.

How much, Mr. Dean? There was \$1.2 billion invested by the Federal Government?

Mr. DEAN. That much had been invested in the power system as of 1959.

Senator LAUTENBERG. What were the years?

Mr. DEAN. They started constructing the power system in 1933 and the last appropriations for the power system were made in the early 1950's; roughly, over a 20-year period.

Senator LAUTENBERG. Those funds extended to the history of inflation would have been significantly different.

Mr. WATERS. Mr. Senator, I can say that everybody that borrowed money didn't pay it back with the same dollars they borrowed.

Senator LAUTENBERG. That is certainly true. But in the case of, essentially government-owned, government-supervised facility, the characterization is a little different.

The only point I want to make there is that this hasn't been a particularly small investment by the Federal Government. It has been a big investment. The fact that some part of it is being repaid is as it ought to be.

But some part of it, of course, is being paid by Mr. and Mrs. Taxpayer across the country, who help you provide residential rates in a number of ways that are way lower than most other parts of the country.

Mr. FREEMAN. The cost of the money when it was borrowed was 2 or 3 percent and we are repaying at the rate of 10 to 12 percent.

Senator LAUTENBERG. Yes. The principal has been out there a long time.

Mr. FREEMAN. You are correct. So we can get this into the proper context, the total investment in the system is now about \$19 billion, of which only the original \$1.2 billion was an investment by the taxpayers.

Senator LAUTENBERG. Right.

Mr. FREEMAN. I think the total equity now of the Federal Government is about \$2.5 billion.

Senator LAUTENBERG. Lest there be any misunderstanding, I am examining this with you. I am trying to understand why it is, we, in the Federal Government ought to—despite the charm and brilliance of your specific Senators here—ought to continue the subsidies at these levels for programs that appear to be linked.

There is common management. There are common facilities. There is a common message that gets out there. I wonder why some of these demonstration programs can't be incorporated into the general power utility?

Mr. DEAN. Part of it is being paid for with the power funds. I am glad you brought that up.

Senator LAUTENBERG. OK.

Mr. DEAN. Mind you, we have up to 2 percent allocation, like most responsible utility systems, in R&D.

Senator LAUTENBERG. Yes.

Mr. DEAN. Which includes our contribution to the Electric Power Research Institute, which is considerable, and other things of this nature. In addition to those things, we are putting \$40 million into this fluidized-bed project over a number of years.

Mr. FREEMAN. Of our ratepayers' money.

Mr. DEAN. Of our ratepayers.

Senator LAUTENBERG. All right.

Mr. DEAN. Because our ratepayers and the country as a whole will benefit, in my opinion, from this project.

Senator LAUTENBERG. That is true also if a New Jersey public utility came upon a technology that permitted more efficient use of sulfur and so forth, and they called you up and said, "Mr. Chairman, we have found this."

That would certainly benefit you, and the fact that it would benefit the ratepayers of New Jersey first doesn't stop it from becoming a natural resource.

Mr. DEAN. We think it will benefit everyone. But the money that goes into that project is paid by all of our ratepayers. As a matter of fact, Con Ed is one of the shareholders of that project.

Senator LAUTENBERG. Well, we like Con Ed but we like PS&G and the other South Jersey utility better.

I made an earlier point about TVA being established years ago to address particularly severe problems that existed in the Tennessee Valley region, are the problems still so severe that there needs to be Federal participation? Mr. Waters talked about businesses—"small and medium sized," I think is what you said—well, we have all kinds of government programs, SBA for one, designed to help small business people get going.

Senator Burdick raised the question about duplication. There are departments of the Government that provide these services, so why is this necessary, with things progressing? There is a lot of waterway access, a lot of research. Why is it still essential that we subsidize this program in that area?

Mr. WATERS. First, Senator, I think you need to realize that a very small amount of appropriated funds that we are talking about here, I think only \$400,000, are in that program.

Senator LAUTENBERG. No, no. I am talking about the general program.

Mr. WATERS. At any rate, whichever program you are referring to, TVA is very careful in its memorandums of understanding, not only with the States, but with all other Federal agencies, so that we do not [have] any duplication.

We have, for example, just by virtue of being a power distributor, working with power distributors—there are 160 that TVA supplies—we have expertise that is particularly suited for going into these industries and seeing where they can expand, to see where they can save on their energy costs.

We provided that service because we are particularly suited and particularly expertised to do that. I submit that is good, that we continue to do that. If some other Federal agency or State agency took that task over, it would cost whoever paid it significantly more money.

Senator LAUTENBERG. You ought not to make that judgment, Mr. Waters. You don't want to assign a program's task based on whether you can do it better than another. I mean, if there is a department of Government doing these things, we have got to say—

Mr. WATERS. We submit that if the Congress or OMB or anybody else found somebody else doing any particular part, they should take that money and put it in the other agencies. TVA doesn't deserve that money if they are not serving a need, if they are duplicating, if they are not doing it better than anybody else.

Now, I think we can [meet] that test on programs that we have, Senator. We are sincere about it. We feel very strongly about that. We are not out in left field doing something that we don't have business in. If we are, we need to get out of it.

Senator LAUTENBERG. Well, there is not a lot of supervision about that, because it is a bit remote. I know you are subject to the microscope but it is still a relatively unique structure.

Mr. WATERS. Yes, it is.

Mr. FREEMAN. We haven't made this point—the two Appropriations Committees, House and Senate, look at us very closely, especially the kinds of programs that you are talking about because those are taxpayer's dollars.

Senator LAUTENBERG. Thank you, Mr. Chairman.

Senator HUMPHREY. Senator Burdick.

Senator BURDICK. One observation, I look at the west coast. I look at your area. I look at New England. I look at the Heartland. We continue to have trouble with these nuclear plants all over the country.

I visited Europe a few years ago, Holland, Belgium, and a few other places. They didn't have any problems.

What is the problem here?

Mr. DEAN. They have undertaken a course where the Government is actively involved in a lot of the construction. They have standardized their designs. They build one and then build another one just like it. They have taken a different course.

I am not dodging the question, sir, but it is a little bit beyond the scope of my personal expertise to go into this. They have picked a design and repeated it over and over again with a minimum of change in the meantime.

In this country we have chosen to allow—for good cause—the design to be changed, while it is under construction. Sometimes the changes are rather radical, which is a cause for it to take a lot longer to get them built.

Things are done in this country for safety reasons. They have done things differently in foreign countries, which has led to quicker construction.

Senator BURDICK. Have we learned something then?

Mr. DEAN. Well, that remains to be seen, Senator.

Mr. FREEMAN. If we were starting from scratch we would do it that way.

Senator SASSER. Mr. Chairman.

Senator HUMPHREY. Senator Sasser.

Senator SASSER. Mr. Chairman, I am going to have to leave shortly for another budget conference. The Budget Conference Committee went back into session at 4 o'clock.

With the chairman's permission, I would like to make one or two observations.

No 1, it is true that the Tennessee Valley Authority has no Inspector General. I raised that point a number of years ago in what was essentially an adversarial proceeding with the Tennessee Valley Authority.

And we, at that point, the TVA along with other members of the Energy and Water Resources Appropriation Subcommittee, agreed that an Office of Audit and Evaluation would substitute for an In-

spector General if this Office was directly responsible to the Board of Directors and no one else.

That, Mr. Chairman, is the reason that there is no Inspector General, because the feeling was that this Office of Audit and Evaluation would serve the same function and indeed it has, we think, very effectively over the past 3 or 4 years.

Now, with regard to TVA setting its own electricity rates, it is true, they are not responsible to a public service commission in much the same sense that a private power company would be.

But they are responsible to their millions of ratepayers and, Mr. Chairman, these ratepayers are voters and those members of us in the Tennessee Valley delegation are certainly responsible to these ratepayers. And as a result the ratepayers vote for us.

I can tell you very quickly that the question of electricity rates can become a very volatile issue with the voters. For this reason, during the eight years that I have been in the U.S. Senate, serving with Senator Stennis, both when he was chairman of the Energy and Water Resources Appropriations Subcommittee, and now as its ranking member, as a member of that subcommittee, we had to exercise vigilant supervision over the Tennessee Valley Authority.

I expect there were times when the Board and the members of the TVA felt this was overvigilant supervision, I would submit, so this has been an agency that has been subject to minute scrutiny by the Congress, because the Energy and Water Resources Appropriation Subcommittee of both Houses watched it very carefully.

In fact, this Board and the preceding Board was very, very vigorously scrutinized whenever they would come before the Appropriations Committee, as they do every year.

With regard to the uranium enrichment facility that was shut down at Oak Ridge, that was really, I think, more of the result of the United States losing out in the international competition for uranium enrichment and the result of nuclear powerplants not being opened up either in this country or abroad at the rate that had originally been projected.

So the old gaseous diffusion plant at Oak Ridge and the new centrifuge facility in Ohio were both terminated as a result of lack of demand, in essence, for uranium enrichment.

Last, I would submit, Mr. Chairman, the TVA operates under a mandate now that is over half a century old. This Board is not responsible for the philosophy that brought this agency into being. But I happen to support that philosophy very strongly.

If we must justify TVA's existence, we must go back to other agencies, such as the Bureau of Reclamation, the Bonneville Power Administration, perhaps even go back so far as to ask the railroads to compensate the Federal Government for the lands given them in the 19th century as this country expanded westward.

I would conclude by saying, Mr. Chairman, we are still 23 percent below the national average in the Tennessee Valley area in regard to per capita income. We still have a ways to go.

We were one of the few regions of this country that has ever been devastated by war, I would say to Senator Lautenberg. In the period from 1861 to 1865, there were more battles fought on the soil of Tennessee than any other section of this country.

Senator LAUTENBERG. We don't have the room for it.

Senator SASSER. Tennessee's devastation was subjected on that area of this country. Essentially we did not recover from that until sometime in the 1940's.

I will conclude by saying this, Mr. Chairman: I think tomorrow, your courtesy in allowing members of the Valley delegation from both parties, from both Houses to appear here and testify, I think you will find an across-the-board, bipartisan, enthusiastic support for this agency and for its works, for its efforts.

I believe you will find this a realistic review. We realize that TVA has problems, the least of which is not the nuclear power end of it. We want to work with what we consider to be a valuable agency in our region. We can rectify these problems.

We have confidence, Mr. Chairman, we can. Thank you for your courtesy in allowing me to appear here today.

Senator HUMPHREY. You are entirely welcome. I am glad to have you, Senator.

Well, let's try to get down to basics here, Mr. Dean. Who owns TVA?

Mr. DEAN. I am sorry, sir?

Senator HUMPHREY. Who owns TVA?

Mr. DEAN. It belongs to the people of the United States, sir.

Senator HUMPHREY. To whom is TVA accountable?

Mr. DEAN. It is accountable, actually, to the people in the broadest sense. This committee is the oversight committee assigned to oversee the activity of the Agency.

As a matter of fact, before we even mentioned, formally, trying to get something done about this pay cap problem, that I mentioned two or three times today, I came up here and talked to Senator Stafford about that because we were very cognizant of this committee's position with respect to TVA.

Senator HUMPHREY. Is TVA accountable to the Department of Energy in any way?

Mr. DEAN. No, sir.

Senator HUMPHREY. You have already said it is not accountable to any public utilities commission?

Mr. DEAN. No, sir.

Senator HUMPHREY. It is not directly accountable to the people it serves except through the congressional representatives.

Mr. DEAN. Well, we are down there with them. We are out among them. We pretty well hear what they have to say.

Senator HUMPHREY. Yes. They hold you directly accountable?

Mr. DEAN. No, sir, not really.

Senator HUMPHREY. Here is another interesting area where you are not accountable. It seems to me that you are not accountable to the marketplace. Have you ever been turned down for a loan by the Federal Financing Bank?

Mr. DEAN. Well, we have always been in the position to go to Wall Street. TVA has issued bonds on Wall Street. We might have to well do it again.

Senator HUMPHREY. But you haven't since 1974?

Mr. DEAN. No, sir. But we have to keep our finances in shape.

Senator HUMPHREY. Have you ever been turned down by FFB?

Mr. DEAN. No, sir, not since they took us on.

Mr. FREEMAN. As a matter of fact, it has been the reverse, Mr. Chairman. When we decided we wanted to finance our nuclear——

Senator HUMPHREY. They came to you, right?

Mr. FREEMAN. They came to us, yes, sir. We were going into the market and they came to us and asked us to let them do it.

Senator HUMPHREY. OK. You have never been turned down by the FFB? Ever?

Mr. DEAN. No, not that I know of.

Senator HUMPHREY. So the last 10 years at least, you have been able to secure your financing without the resort to the traditional means and accountability to the marketplace?

Mr. DEAN. What is that, sir?

Senator HUMPHREY. Without accountability to the marketplace.

Mr. DEAN. What does the Senator mean by accountability?

Senator HUMPHREY. Without having to sell your paper to the private sector.

Mr. DEAN. That's correct, for the last 10 years.

Senator HUMPHREY. You have no Office of Inspector General, independent of the Board?

Mr. DEAN. No, sir.

Senator HUMPHREY. Don't get me wrong, I wouldn't want your job, but this is one of the most tightly enclosed loops that I have ever seen. This is tighter than a triangle. This is a titanium ring. This is a closed operation.

It is not right that it should be so. I think it needs fundamental and structural changes. I am not talking about selling TVA. I saw some eyebrows go up, earlier. I am not inviting Custer's last stand or anything.

I do have some ideas. I expect to have some more when we conclude this process in a few months time that will be of benefit to the people you serve and to the people of this country.

I feel fairly sure that most Members of Congress, including the representatives of the people of the TVA region, will support this.

How much of that part of TVA's capital, which was appropriated by Congress prior to 1959, which you referred to as "invested," how much have the taxpayers invested in the power portion of TVA?

Mr. DEAN. \$1.2 billion was appropriated to TVA prior to 1959. I presume that is what you are referring to.

Senator HUMPHREY. How much is that in constant 1984 dollars?

Mr. DEAN. I don't know that, sir.

Mr. FREEMAN. We can calculate that.

Senator HUMPHREY. All right. That will be interesting to see. You have been repaying that since 1959?

Mr. DEAN. In accordance with the act.

Senator HUMPHREY. How much of the \$1.2 billion have you repaid?

Mr. FREEMAN. \$400 million.

Senator HUMPHREY. \$400 million. You have paid back a third of the principal in then-year dollars.

Mr. DEAN. The principal is coming back in then-year dollars but the interest is in today's dollars.

Senator HUMPHREY. How much have you paid in interest since 1959?

Mr. DEAN. I don't know.

Senator HUMPHREY. Well, please go to that. Is there some date fixed in law or some date by which you will have repaid this \$1.2 billion?

Mr. FREEMAN. Congress decided in 1959 that some \$200 million should be left as Uncle Sam's equity. The statute provides for us to repay \$1 billion and not the original \$1 billion plus.

Senator HUMPHREY. I see. Is there a date fixed in law?

Mr. FREEMAN. Yes; 50 years.

Senator HUMPHREY. 50 years since 1959?

Mr. FREEMAN. Yes.

Senator HUMPHREY. To 2009?

Mr. FREEMAN. Yes; I may be off a year or two.

Senator HUMPHREY. A 50-year repayment?

Mr. FREEMAN. It is a little longer than that because the original payments were less than now.

Senator HUMPHREY. By the year 2009, that would have been approximately 70 years since these appropriations outlays. You will be repaying \$1.2 billion in constant money. I mean that is a pretty good deal.

Mr. WATERS. Senator, Mr. Chairman, I have just been advised that we have paid over \$1.5 billion in interest.

Senator LAUTENBERG. What year?

Mr. WATERS. Through 1984.

Senator HUMPHREY. Through 1984. In 15½ years you have paid approximately \$4 billion in interest. I see.

Mr. WATER. Yes, sir.

Senator HUMPHREY. On approximately \$1 billion in principal. Well, I think both from the standpoint of the principal and the interest, that TVA has gotten a bargain in that it constitutes a subsidy.

I am not saying that we have to back up or that there is any way to back up. I was not even concocted when this scheme was concocted and neither were many of you here.

Mr. FREEMAN. Mr. Chairman, just to complete the loop, the head of OMB, who has been critical of TVA in other respects, has cited TVA as the model in terms of financial integrity in what a Federal power agency should be.

And indeed they recommend that if other Federal agencies had the kind of schedule, the kind open——

Senator HUMPHREY. Who is that?

Mr. DEAN. Mr. Stockman.

Mr. FREEMAN. Mr. Stockman.

Mr. WATERS. TVA has never missed a payment.

Senator BURDICK. Didn't you gentlemen specify that interest is based on the cost of money currently?

Mr. FREEMAN. Current cost.

Mr. DEAN. Yes.

Senator HUMPHREY. OK, fine, fine. It is still below what you pay in the marketplace. It is still below market rates. Current rates and market rates aren't the same. It constitutes a bargain. It still constitutes a subsidy. That is the way it is. That is the way it started. I am not going to change that. I do have some other changes in mind.

You haven't yet had to repay any of the borrowings from the Federal Financing Bank?

Mr. DEAN. Mr. Sanger could answer that best.

Mr. SANGER. We made our first borrowings in 1974 and as far as the long-term borrowing, most of those are 25- to 30-year borrowings. We have repaid short-term borrowings on numerous occasions.

Senator HUMPHREY. Your long-term borrowings are how much?

Mr. SANGER. The amount outstanding?

Senator HUMPHREY. 13.4.

Mr. SANGER. The total long-term outstanding FFB debt at the end of 1984 was about \$13.2 billion.

Mr. FREEMAN. About \$1 billion of the debt with the FFB is short term. It is rolled over. We will sometimes substitute long term for short term.

Senator HUMPHREY. OK. So \$2 billion of that is long term and has not yet fallen due?

Mr. SANGER. That's right, as indicated, the precise number is \$13.2 billion.

Senator HUMPHREY. Are you going to be able to make the payment in 1987? Has the board made a decision on what it plans to do with respect to that first repayment?

Mr. SANGER. Our statute and basic bond resolution requires the board to set rates to, provide sufficient funds for debt service on outstanding bonds. We have approximately \$2 billion outstanding in the public market. TVA has paid interest on those bonds as it has come due. Our bonds are always triple A. And they have retained their triple A rating since 1974 when we began borrowing from FFB.

Senator HUMPHREY. Now, you are required by internal regulations to set rates?

Mr. SANGER. The statute that originates from this committee determines how we set rates.

Senator HUMPHREY. The statute?

Mr. SANGER. Yes, sir.

Senator HUMPHREY. You have to repay? There is no means of rolling over?

Mr. SANGER. Oh, yes. You can refund.

Senator LAUTENBERG. They can borrow.

Senator HUMPHREY. From FFB.

Mr. FREEMAN. Or the market, whichever.

Senator HUMPHREY. Are you going to the market or FFB?

Mr. FREEMAN. That will be a decision in 1987.

Senator HUMPHREY. That is a pretty safe bet.

Mr. FREEMAN. Or it may be generated from depreciation.

Senator HUMPHREY. All right. So you do have the flexibility to roll it over as opposed to repayment?

Mr. SANGER. Nevertheless, there are certain financial tests that must be met so that rolling over the debt doesn't produce an irresponsible result.

The board has three tests to meet, two of which are set by statute. These ensure that if the board does that kind of refunding, it has equal amounts reinvested in the power system. So there can't be any gamesmanship. The market is smarter than that.

Senator HUMPHREY. All right. You do have the option of rolling over. Has the board made a decision yet?

Mr. DEAN. No, sir. We don't have to make that decision until 1987. If we can borrow money at that time, cheaper than our ratepayers can, then it is to our ratepayers' advantage that we roll it over.

Mr. FREEMAN. As the general counsel indicated, we have to be able to meet certain tests under our bond covenants and the statute in order to be able to borrow additional money.

It must have provided how that money is going to be used. That was the point.

Senator HUMPHREY. Has FFB inquired about your intent?

Mr. DEAN. No, sir; not to my knowledge.

Senator HUMPHREY. How about OMB?

Mr. DEAN. Not to my knowledge.

Mr. SANGER. We pay regularly when due.

Senator HUMPHREY. This is a big chunk coming up.

Mr. DEAN. He asked about whether they had inquired about our intent to roll over.

Mr. SANGER. No.

Mr. FREEMAN. What is the 1987 payment for, bonds?

Mr. DEAN. A small payment, really.

Senator HUMPHREY. What would happen if, as some have indicated, TVA were barred from further use of the Federal Bank?

Mr. DEAN. We would go back to the open market, the same as we were before.

Senator HUMPHREY. What would be the ramifications?

Mr. FREEMAN. Well, we explored that 3 or 4 years ago with the market. We talked to some of the bond rating houses. It is very difficult to estimate.

We have all kinds of judgments from 25 basis points to 150 basis points. It is difficult to judge. My judgment is that it would be on the lower side, but I don't know.

Senator HUMPHREY. You would have to pay up to a point and a half higher than what you are paying currently?

Mr. FREEMAN. The estimates vary.

Senator HUMPHREY. Up to one and a half. Are there any circumstances in which you would roll over?

Mr. DEAN. Yes, sir; as I said before, if you can borrow money cheaper than your customers can, it is to their advantage that we roll it over.

Senator HUMPHREY. Just that one circumstance?

Mr. DEAN. Sir?

Senator HUMPHREY. Just that one circumstance?

Mr. FREEMAN. We have to meet the test.

Mr. DEAN. The bond test, yes.

Senator LAUTENBERG. You have to have all the ratios?

Mr. DEAN. That is exactly right.

Senator HUMPHREY. Why do you keep insisting that power is self-financing, that there is no element on financing? Similarly, you are paying less to borrow money—even on short-term loans—that you have repaid. You are paying less than in the marketplace.

You borrow from FFB. FFB borrows from the Treasury. The Treasury borrows on 90-day notes or some stupid, uneconomic way

of doing it. The taxpayers end up subsidizing TVA to this extent. Is that not correct?

Mr. FREEMAN. We pay the FFB the amount of their cost of borrowing the money plus one-eighth, which is one-eighth of one percent, which is less than their cost of handling the transaction.

From the taxpayers standpoint, there is no loss; indeed, there is a slight benefit.

Senator LAUTENBERG. But, there is use of Federal credit?

Mr. FREEMAN. That is correct. That is the reason that I said it was advantageous on both sides.

Senator HUMPHREY. We will come back to that in just a moment.

I want to ask you, Mr. Dean, has your staff submitted a table showing the congressional appropriations to TVA power in then-year, constant-year dollars, to 1984; and the payments so far in then-year, constant dollars; and the anticipated payment in then-year, constant dollars?

Mr. DEAN. All right.

Senator HUMPHREY. Will you have them take care of that?

Mr. DEAN. Yes, sir.

Senator HUMPHREY. I would like to have a copy of that sent to my office, in addition to that which comes to the committee. I will probably not see it. Nobody has time to go back to review all that stuff.

If it comes into my office, I will see it.

Mr. DEAN. We will certainly do that, sir.

[The information requested follows:]

Question: Please provide a tabulation which shows the congressional appropriations to the TVA power system, payments so far, and anticipated payments on a then-year basis and a constant dollar basis.

Answer: The requested tabulation is provided below. From this tabulation one can easily see that the terms of the 1959 change in TVA's power financing have been and will continue to be a sensible and financially beneficial arrangement for the U.S. Treasury (i.e., taxpayers).

One consideration pertinent to this issue concerns the economics of TVA's repayment of the appropriated investment in the power system as set forth in the 1959 amendment to the TVA Act. This amendment established a payment schedule which requires TVA to repay to the U.S. Treasury \$1 billion of the appropriation investment in the power system. In addition, an annual return ("dividend") based on the U.S. Treasury's average cost of money at the end of each preceding year is required. TVA has made all the payments required by the Act. At the end of fiscal year 1985, almost one-half of the \$1 billion will have already been repaid. At the end of fiscal year 1985, TVA will have made the following payments:

Return ("dividend").....	\$1,605 million
Repayment (of "investment").....	<u>430 million</u>
Total payment through 1985.....	\$2,035 million

The following analysis demonstrates that the Treasury, not TVA, is the net beneficiary of these requirements. Had TVA gone to the financial markets in 1961 and sold 25-year bonds at the then-current rate of 4.4 percent and "paid off" the Treasury investment of \$1,000 million required to be repaid, total payments on those 25-year bonds (including their repayment) would have been \$1,675 million by the end of this year, far less than the \$2,035 million which will have been paid into the Treasury at the end of fiscal year 1985. Furthermore, under the current payment schedule, \$570 million remains to be paid along with the annual return ("dividend") over the remaining 28 years of scheduled payments.

The obvious conclusion is that the Treasury has, in economic terms, recovered its costs associated with the TVA power system and that all future payments are pure "profit" to the Treasury.

TVA POWER SYSTEM FINANCING
1934-1960

FISCAL YEAR	APPROPRIATIONS BY CONGRESS	OTHER ADDITIONS TO GOVERNMENT EQUITY	PAYMENTS TO US TREASURY	US TREASURY NET CASH FLOW	US TREASURY NET CASH FLOW IN 1960 \$
1934	\$17,830,400		\$0	(\$17,830,400)	(\$47,700,486)
1935	\$17,830,400		\$0	(\$17,830,400)	(\$46,700,263)
1936	\$17,830,400		\$0	(\$17,830,400)	(\$45,741,169)
1937	\$17,830,400		\$0	(\$17,830,400)	(\$44,820,524)
1938	\$17,830,400		\$0	(\$17,830,400)	(\$43,976,459)
1939	\$22,448,000	\$8,572,500	\$60,479	(\$30,960,021)	(\$74,813,679)
1940	\$27,114,000	\$52,000,000	\$432,082	(\$78,681,918)	(\$186,009,902)
1941	\$11,509,000	\$4,500,000	\$484,602	(\$15,524,398)	(\$34,120,593)
1942	\$98,472,000		\$742,979	(\$95,726,021)	(\$191,639,413)
1943	\$53,472,000		\$2,778,291	(\$50,694,709)	(\$96,367,640)
1944	\$4,490,000		\$736,624	(\$3,753,376)	(\$6,567,222)
1945	(\$4,268,000)		\$2,776,207	\$6,995,207	\$12,676,621
1946	\$2,259,000		\$10,075,608	\$7,776,608	\$12,175,318
1947	\$3,190,000		\$10,859,348	\$7,669,348	\$10,673,385
1948	\$3,335,000		\$11,063,926	\$7,528,926	\$9,762,950
1949	\$7,797,000		\$6,076,771	(\$1,760,229)	(\$2,703,324)
1950	\$32,540,000		\$6,438,451	(\$26,101,549)	(\$33,479,767)
1951	\$106,642,000		\$7,667,991	(\$96,778,009)	(\$116,459,066)
1952	\$199,843,000		\$12,743,097	(\$187,099,903)	(\$221,922,710)
1953	\$194,767,000		\$13,674,757	(\$178,692,243)	(\$208,707,197)
1954	\$269,956,000		\$20,592,376	(\$249,262,624)	(\$287,562,422)
1955	\$196,941,000		\$50,398,437	(\$146,542,563)	(\$185,474,590)
1956	\$47,092,487		\$59,042,187	\$11,949,700	\$13,074,445
1957	\$11,372,358		\$30,000,000	\$18,627,642	\$19,709,210
1958	\$4,741,455		\$10,000,000	\$5,258,545	\$5,470,352
1959	\$3,367,621		\$0	(\$3,367,621)	(\$3,422,420)
1960	\$2,306,358		\$0	(\$2,306,358)	(\$2,306,358)
	\$1,286,746,279	\$65,072,500	\$260,811,223	(\$1,190,607,556)	(\$1,776,981,773)

TVA POWER SYSTEM FINANCING
1985-2014

FISCAL YEAR	APPROPRIATIONS BY CONGRESS	OTHER ADDITIONS TO GOVERNMENT EQUITY	PAYMENTS TO US TREASURY	US TREASURY NET CASH FLOW	US TREASURY NET CASH FLOW IN 1985 \$
1985			\$116,546,000	\$116,546,000	\$116,546,000
1986			\$114,410,000	\$114,410,000	\$109,465,510
1987			\$108,897,000	\$108,897,000	\$99,114,095
1988			\$94,875,000	\$94,875,000	\$82,220,415
1989			\$92,975,000	\$92,975,000	\$76,471,698
1990			\$91,075,000	\$91,075,000	\$71,584,591
1991			\$89,175,000	\$89,175,000	\$66,755,612
1992			\$76,653,000	\$76,653,000	\$54,660,629
1993			\$75,052,000	\$75,052,000	\$50,994,411
1994			\$73,453,000	\$73,453,000	\$47,492,191
1995			\$71,853,000	\$71,853,000	\$44,438,832
1996			\$70,253,000	\$70,253,000	\$41,403,728
1997			\$68,653,000	\$68,653,000	\$38,659,756
1998			\$67,053,000	\$67,053,000	\$36,206,203
1999			\$65,453,000	\$65,453,000	\$33,837,432
2000			\$63,853,000	\$63,853,000	\$31,570,001
2001			\$62,253,000	\$62,253,000	\$29,597,242
2002			\$60,653,000	\$60,653,000	\$27,728,742
2003			\$59,053,000	\$59,053,000	\$25,959,968
2004			\$57,453,000	\$57,453,000	\$24,116,946
2005			\$55,853,000	\$55,853,000	\$22,793,731
2006			\$54,253,000	\$54,253,000	\$21,256,158
2007			\$52,653,000	\$52,653,000	\$19,788,725
2008			\$51,053,000	\$51,053,000	\$18,450,281
2009			\$49,453,000	\$49,453,000	\$17,183,957
2010			\$47,853,000	\$47,853,000	\$15,983,694
2011			\$46,253,000	\$46,253,000	\$14,840,277
2012			\$44,653,000	\$44,653,000	\$13,793,969
2013			\$43,053,000	\$43,053,000	\$12,787,543
2014			\$31,453,000	\$31,453,000	\$9,982,915
	90	90	\$2,056,170,000	\$2,056,170,000	\$1,274,570,962

Senator HUMPHREY. What about this business of creating a California-based company, wholly owned subsidiary of TVA, selling down your enriched fuel rods, is that correct?

Mr. DEAN. Various forms of uranium.

Senator HUMPHREY. Selling your excess uranium and then lending them the money, which you have already gotten from the FFB, to buy it. I mean, what is the purpose of that transaction?

Mr. FREEMAN. That is not a subsidiary of TVA. The purpose of the transaction—

Senator HUMPHREY. Before we go any further, what is the nature of that entity?

Mr. FREEMAN. It is an independent entity with whom we have a contract to sell uranium and they, then, lease it back.

Senator HUMPHREY. It is a private concern?

Mr. FREEMAN. Yes.

Senator HUMPHREY. A private stockholder concern?

Mr. FREEMAN. Yes. The purpose of—

Senator HUMPHREY. Is it registered with the FTC?

Mr. FREEMAN. I don't know if it is registered with the FTC or not. Maybe it is, I don't know. It has met all the requirements.

The purpose of the transaction—we are doing what almost every utility that is in the nuclear business is doing. We have created a third party with whom you make your lease transaction so that you can then capitalize the fuels and you don't charge your customers for fuel until you use it. That is the purpose.

Senator HUMPHREY. What is the advantage to TVA and the people that TVA serves?

Mr. FREEMAN. The value to the people being served is to avoid rate increases in the years when the uranium is not being used. It postpones the time at which the rate payer makes the payment to the time of use. It is very popular with our ratepayers.

Senator HUMPHREY. You substitute borrowing, at cost to all the taxpayers of America through the FFB, for raising your rates to the people you serve?

Mr. FREEMAN. No. The transaction would be the same whether the FFB is involved or not. As a matter of fact, that is another instance in which we put the transaction together and were prepared to do this in the marketplace and FFB asked us please not to do so.

Senator HUMPHREY. Isn't that a cost shifting mechanism, shifting the costs from the beneficiaries of TVA to all the taxpayers?

Mr. FREEMAN. No. It is a time shift from today's ratepayers to the time that the uranium is used, which may be 5 or more years out. It is a question of generations of ratepayers.

Senator HUMPHREY. Who instigated the setting up of that program?

Mr. FREEMAN. Well, I don't know who instigated setting it up.

Senator HUMPHREY. What role did TVA play in that?

Mr. FREEMAN. Mr. Sanger, they want to know who instigated the start up.

Mr. SANGER. TVA started up the arrangement. We were discussing the arrangement with a private bank house. FFB became aware of it, my recollection is, and asked TVA to do the arrangement through the FFB.

The Seven States Energy Corporation was established as the private financial mechanism for doing this. It receives a fee for doing it much the same as a New York Banking House would receive one if it had been doing it.

Senator HUMPHREY. OK. That is a curious thing.

Mr. FREEMAN. It is very traditional. There is not a utility of any consequence, that has nuclear operations, that doesn't do the same thing.

Senator HUMPHREY. You have enriched uranium, isn't that what you have?

Mr. DEAN. In its various forms. Some of it has not been enriched yet.

Senator HUMPHREY. OK. So you have already incurred the costs of producing it. Then you sell it to somebody else. You borrow the money to give to them to buy it. You have already incurred the cost for manufacturing it.

Mr. FREEMAN. Correct.

Senator LAUTENBERG. It is a corporate asset. You are either borrowing or selling a corporate asset. You can borrow against it. You can have collateral on it. I don't think it is unusual. The nuclear materials are unusual to be using for that. But it is like any other asset, a patent or product.

Senator HUMPHREY. None of the private utilities use the Federal Financing Bank to set up such a transaction.

Mr. FREEMAN. That is true. And we did not want to until they asked us to.

Senator HUMPHREY. Well, that is very commendable. They are coming looking for customers. It is all off-budget.

Mr. FREEMAN. That is on-budget.

Senator HUMPHREY. I mean with respect to the Federal budget.

Mr. FREEMAN. The amounts of the TVA borrowing are covered in the Federal budget. Unfortunately, they are doubly counted. They have been counted for at one time and then each year they are accounted for again.

So there is a double counting to the disadvantage of the budget numbers.

Senator HUMPHREY. It is my understanding that borrowings from the Treasury, borrowings from the FFB are not on-budget. Is that correct?

Mr. FREEMAN. I don't know about that. The TVA borrowings from the FFB are on-budget.

Senator HUMPHREY. Fine.

Mr. FREEMAN. The same numbers are on-budget.

Senator HUMPHREY. Very well.

Mr. FREEMAN. Furthermore, it is counted twice because the original borrowing authority has already been accounted for, so, in that sense, there is a double accounting.

Senator HUMPHREY. There is another double entry there, too, because Treasury doesn't show the loans to FFB on-budget, but it does show as assets the interest paid on those loans.

They don't show the loans, but they show the interest, if I understand that correctly.

In any event, on page 10 of your testimony, Mr. Chairman, you say, referring to the cancelled nuclear units,

We have been able to cancel unneeded nuclear units and develop financial measures for absorbing the loss, without creating sharp rate increases.

Is that what we are talking about here?

Mr. DEAN. Yes, sir. Our financial people had to devise a way. It goes back to the fact that we mentioned earlier, we do have outside auditing firms.

We are very careful about what we show on our books as assets and liabilities. And we were carrying some nuclear reactors on our books. The asset would have been how much money we had spent up to that point on construction. It was apparent that we were not going to be able to be in a position to resume construction on those plants in the reasonable future.

Therefore, we had to write them off the books. To write an asset off the books, you have to clean it off in a logical fashion. So to make a long story short, we took steps to dispose of \$4 billion, roughly. We had to clean the assets off our books.

We were doing it over a period that extends to approximately 1991. We have various systems in place. They were all assigned to minimize the effect on the ratepayer. We had to buy, for instance, some zero coupon bonds which would come due to cover that part of the construction.

That is—of course, it does have an effect on the ratepayer, where we spread it out to a point where we tried to minimize the damage done by having to cancel the plant.

Senator HUMPHREY. You are postponing the effect. Is that what you are saying?

Mr. DEAN. No, sir.

Mr. FREEMAN. It is spread out.

Senator LAUTENBERG. Don't you accrue the interest expense on zero coupons?

Mr. FREEMAN. I think we must, yes.

Senator LAUTENBERG. You better have.

Mr. FREEMAN. We are sure. To answer the Chairman's question, this is a spreading out of the impact. Of course, the outside auditor is always concerned about the integrity of that process. We would not take that step without the approval of the outside auditor. The way in which we are doing it has our auditor's approval.

Senator HUMPHREY. OK. So you have written off \$4 billion. Is that correct?

Mr. DEAN. Correct.

Senator HUMPHREY. Ultimately, the ratepayers are going to feel some of that, right?

Mr. DEAN. That is correct.

Senator HUMPHREY. I will leave it to others to judge those events.

Mr. DEAN. Nobody in the utility business is happy over having to cancel nuclear plants.

Senator HUMPHREY. I know, but TVA has a spectacularly bad record in long-range planning, having to cancel almost half, 8 out of 17 plants.

Mr. FREEMAN. There are other utilities that have cancelled.

Senator HUMPHREY. That percentage?

Mr. FREEMAN. Yes.

Senator HUMPHREY. Would you ask some people to provide those examples for the record?

Mr. FREEMAN. Yes, sir.

[The information requested follows:]

Utilities With Canceled Units

<u>Utility</u>	<u>Nuclear Units</u>		
	<u>Canceled</u>	<u>Under Construction or Operating</u>	<u>Percent Canceled</u>
1. San Diego Gas and Electric.....	2	0	100
2. Potomac Electric Power.....	2	0	100
3. Ohio Edison.....	2	0	100
4. New England Power.....	2	0	100
5. New York State Electric and Gas	2	0	100
6. Public Service of Oklahoma.....	2	0	100
7. Puget Sound Power and Light....	2	0	100
8. Cincinnati Gas and Electric....	2	0	100
9. Public Service of Indiana.....	2	0	100
10. Delmarva Power and Light.....	2	0	100
11. Northern Indiana Public Service	1	0	100
12. Gulf States.....	3	1	75
13. Alabama Power Company.....	4	2	67
14. Boston Edison.....	2	1	67
15. Wisconsin Public Service.....	2	1	67
16. Toledo Edison.....	2	1	67
17. Detroit Edison.....	2	1	67
18. Portland General Electric.....	2	1	67
19. Jersey Central Power.....	2	1	67
20. Long Island Lighting Company...	2	1	67
21. Virginia Electric and Power...	4	4	50
22. Public Service Electric.....	3	3	50
23. Houston Power and Light.....	1	1	50
24. Omaha Public Power District....	1	1	50
25. Rochester Gas and Electric.....	1	1	50
26. Union Electric.....	1	1	50
27. Illinois Power.....	1	1	50
28. Tennessee Valley Authority.....	8	9	47
29. Duke Power.....	6	7	46
30. Carolina Power and Light.....	3	4	43
31. Northern States Power.....	2	3	40
32. Arizona Public Service.....	2	3	40
33. Washington Public Power Supply System.....	2	3	40
34. Consumers Power.....	2	4	33
35. Philadelphia Electric.....	2	4	33
36. Northeast Utilities.....	2	4	33
37. Georgia Power.....	2	4	33
38. New York Power Authority.....	1	2	33

Senator HUMPHREY. I am not trying to be personal. I am suggesting that there are fundamental structural problems that prevent efficient running of TVA.

I haven't even gotten into this appropriated accounts. We will save that for another day.

Senator Lautenberg is getting impatient.

Senator LAUTENBERG. I appreciate it, Mr. Chairman.

I hope that I didn't have a lapse in listening when we talked about accruing expenses for the elimination of programs. I heard Mr. Dean talking about zero coupon bonds as a way of borrowing. Are we on the same track?

Mr. DEAN. Zero coupon bonds are to retire the bonds that were issued.

Senator HUMPHREY. That interest is accrued, even if not paid until the end of the period?

Mr. FREEMAN. Yes.

Senator LAUTENBERG. To be certain that I didn't mislead my colleague, you said something about basis points, 100 basis points are equivalent to what?

Mr. DEAN. One percent.

Mr. FREEMAN. One percent.

Senator LAUTENBERG. One percent?

Mr. DEAN. Yes, sir.

Mr. FREEMAN. The range I gave you was from 25 to 150.

Senator LAUTENBERG. A quarter of a point to a point and a half.

Mr. FREEMAN. Correct.

Senator LAUTENBERG. I think that Senator Humphrey does make one very significant point in terms of the structure of his examination. I am sorry that Senator Sasser isn't here.

Who does your outside auditor report to?

Mr. DEAN. The Board of Directors.

Senator LAUTENBERG. OK. You know where I am going. When I was CEO, that outside auditor turned his report over to the audit committee of the Board, non-employees. There was one employee on that Board. That is more traditional.

The same thing is true—the chairman likes to use the term “inspector general”—you call it internal audit department, which is essentially what you have created, but they report to the people who are ultimately responsible for their employment.

So I don't think that any of you—Mr. Freeman, you have had experience with this in the private business sector, I know Mr. Dean has also had experience, although not in the corporate area—but there is a question of checks and balances.

Mr. DEAN. The report does go to the Appropriations Committee. It is not just in-house. It is submitted to Congress and the GAO.

Senator LAUTENBERG. You know the kind of review.

Mr. FREEMAN. The GAO review is not cursory.

Senator LAUTENBERG. I am sure it isn't. The Appropriations Committee, on which I also sit—I don't want to take blame for that—is not likely to be as thorough as an internal board of directors, who are responsible.

What I see here is a serious review being taken as to whether it is possible, within the mandate of Congress, to change that structure, as it ought to be reviewed.

I mean to get your kind of talent, the three of you, for \$216,000 a year, that is pretty good. But on the other hand, I also think that a company of this size, the responsibility it has, ought to have another management level, that it ought to be appropriately compensated.

You ought not to have the luxury of falling back where you can say, "Look, we can't afford to pay you." If we can't afford to pay, we ought to ground the airplane.

Very quickly, we have sat here long enough, TVA; we see it as confined to the same geographic region and you make the point that it is a national resource. Could any one of you, very briefly, tell me what States like New Jersey, New Hampshire, North Dakota, and any others have derived benefits other than in the broadest sense, like if the SFCB were some of the soil erosion?

I mean, we have the same projects going on in the Department of Agriculture. We have the same thing coming out of the processes of commercial enterprise. It goes around licensing people to use their equipment to use their process. Does that tell the whole story?

Mr. FREEMAN. Let me give you an example and my colleagues may wish to give you an example.

Floodplain management is one of the earliest examples. TVA designed it as an alternative to a structural change in the river to deal with local flood problems.

That program has been copied all over the country, and indeed the Federal Flood Insurance Program was founded upon the floodplain management kinds of activity pioneered by TVA.

More recently, we have designed an energy and environmental educational system with its valley institutions, where we now have 14 institutions that are included. We are halfway through.

Senator LAUTENBERG. Unique to TVA?

Mr. FREEMAN. Well, the program is unique. We have five of those schools now on their own. They get no help from us. We now have had three regions come to us and say, "How did you do it? We want to try it."

One is South Dakota; one is California. I forget where the other one is. These are specific things that we have done because we have the flexibility to try things out.

We can do it on a small scale. If it works, we advertise it to the rest of the country so indeed they can learn from those experiences.

I gave you two. My colleagues may want to give you more.

Mr. DEAN. We have an experiment going on converting waste hardwood to alcohol. If it works, it will justify every nickel that the country has put in all our programs.

We are past the last stage now. We take hardwoods and treat them in certain ways, ferment them in alcohol.

Senator LAUTENBERG. Can they also be drunk?

Mr. DEAN. They could.

Mr. FREEMAN. As a matter of fact, it is ethanol, not methanol.

Senator LAUTENBERG. I heard Senator Gore verify that it is a friend of the Tennessee recreations area.

Mr. DEAN. This is not to be confused with good corn liquor, sir. This would be cheap wood alcohol but would burn in an automobile instead of gasoline. It would be a way of converting wood all over the country into alcohol. The thing is past the last stage. We are building a pilot plant at Muscle Shoals now. That is just an example of one of the types of projects that we have going.

Senator LAUTENBERG. Why wouldn't Mobil Oil or Exxon or one of those do it?

Mr. DEAN. It is not one of those things—it is not the obvious thing that they would want to risk money in. It takes a lot of painstaking research. There is the lab stage. There is the pilot stage.

If that works, even then they might not want to get into it. It might be one of those things even if we got up to 70 gallons per ton of wood, I have got to look at the relative cost between the alcohol and the gasoline in that day and time, which is one of the things that happened to coal gasification. But still, the process is available.

Mr. FREEMAN. The payoff will be to many years out.

Mr. WATERS. Senator, you might notice this chart over here that shows the plants licensed to TVA-developed processes or equipment. This is primarily concerned with fertilizer. This shows them scattered all over the United States. I don't know if you can see that.

Senator LAUTENBERG. I see it very well.

The focus here is not a particular reason. We are saying that this R&D is a Government-sponsored project. Since we are looking for funding here, it is our responsibility to include a review of these functions to see whether they are worth the taxpayers' money.

Mr. WATERS. As you should.

Mr. FREEMAN. Just to nail that one down, those are the processes developed at Muscle Shoals; processes which, I think we can say with some considerable confidence, would not otherwise have been developed or it would have been a long, long time in the future before they were.

So there is a direct cause and effect relationship between research and its adoption. The Government—as you point out, the private sector, in many instances does that very well. The Government hasn't always done that.

TVA has demonstrated that the transfer of technology can be done in the fertilizers research area in a very quick manner which has had a big payoff for the ultimate consumer.

Senator LAUTENBERG. OK. I come back to the fact that if we are going to give a subsidy—now that I am out of the private sector, I would like to give tax incentives, if it is possible, to business.

I just want to ask you, how much of the Tennessee Valley is also included in the geography served by the ARC.

Mr. WATERS. Forty-seven percent of the State of Tennessee is in the ARC and all of West Virginia.

Senator LAUTENBERG. Mississippi?

Mr. WATERS. A small part of Mississippi.

Senator LAUTENBERG. Some functions overlap, do they not?

Mr. WATERS. ARC and TVA?

Senator LAUTENBERG. Yes; regional development.

Mr. WATERS. The concept of regional development overlaps to a certain extent.

Senator LAUTENBERG. But you don't see any overlap?

Mr. WATERS. Not in these programs.

Mr. FREEMAN. He was cochairman of the ARC.

Senator LAUTENBERG. Now he is not.

Mr. WATERS. That was 15 years ago, Senator. I don't think there are any programs that overlap now.

Senator LAUTENBERG. I am not doubting you.

Mr. WATERS. We are cooperating with ARC, TVA is, in hardwoods export development, particularly in finding ways to export hardwoods to develop markets abroad.

Senator LAUTENBERG. I thank the chairman for permitting me to have the platform. I would also like to say to you, my compliments on your knowledge and information about this vast empire.

You have a great responsibility. I think when you present relatively modest Federal spending levels over the area you serve, that has to be compared with the per capita income in that area. I think you will find that your requests are relatively modest. A large part of that, of course, is derived out of public projects.

Thank you very much.

Senator HUMPHREY. Thank you, Senator. Just a few last odds and ends. I want to quote from a memo from David Stockman, with no date but I think it was early 1981, at the start of the new administration, relative to TVA and its advantages secured through FFB financing.

It says:

Compared to independently owned utilities, TVA enjoys substantial financial leverage in the market.

The advantage of FFB financing is estimated at one percent per year over the private markets. TVA borrowing is not backed by the government, but is perceived to be, and therefore commands a favorable loan rate. The bond rating is triple-A. Bondholder exemptions from State and local taxes give TVA advantage.

The overall borrowing advantage accruing to TVA is estimated to be about \$40 million. The current practice of TVA borrowing from the FFB is to the disadvantage of Federal taxpayers. The transfers to TVA is getting a more favorable financial status, providing subsidies to TVA ratepayers.

TVA commands 30 to 40 year capital assets from 90 to 180 day Treasury paper encouraging TVA management to remain committed to an ambitious construction program.

I am not sure this is valid any longer. Now, two more things. Relative to my discussion, as I perceive it, there is a lack of accountability in the whole TVA structure. The Board members, of which there are three, you gentlemen are here today, are doing your very best to do a difficult job under difficult circumstances.

You are appointed for 9 years. You are the Board of Directors. You cannot be removed by the ratepayers. By what means can you be removed?

Mr. DEAN. A concurrent resolution of the House and Senate.

Mr. FREEMAN. One director was removed by the President.

Senator HUMPHREY. What?

Mr. FREEMAN. One director was removed by the President of the United States.

Senator HUMPHREY. OK. By the President? He also has the authority to remove?

Mr. FREEMAN. By the President.

Senator HUMPHREY. So there are two routes. Is that true?

Mr. SANGER. There can be two routes. The act specifies the concurrent resolution. The President also has certain authority under certain circumstances.

Senator HUMPHREY. All right. My point is that only by extraordinary measures can the Board be removed.

Senator HUMPHREY. Next in my further discussion, is the lack of accountability, as I see it.

And finally, I want to thank you for your patience and your good sportsmanship and particularly your constructive attitude that you all have. It has been very constructive. That is the way I want it to be.

Senator Gore.

Senator GORE. Just one brief point. I want to again thank you for your courtesy, Mr. Chairman.

I want to underscore the point, for the record, at this stage, TVA made a payment to the Treasury last year of \$113 billion which reduced the deficit by that amount, and that is the only Federal power agency in the entire country that makes payments of that kind at the current market rates.

Second, a number of times the ability of TVA to secure financing through the FFB has been labeled as subsidy by the taxpayers. I want to clarify that for the record because I have been through the entire hearing today.

But I noticed kind of a disconnect between assertions made on that score and responses from the Board members. To some extent this revisits a public debate that was held during 1981 and 1982 about this question.

My perception, having observed that debate, is that we won that argument rather decisively. And I don't hold hopes of convincing the chairman on that point.

But I just want to observe that there is a distinction in my mind between TVA being able to get a somewhat lower rate by 25 to 150 basis points on the one hand, and a taxpayer subsidy on the other hand.

It may be that TVA's structure confers certain advantages just because of its structure. If it is able to get lower rates, then it should not be criticized just because of that.

Kurt Vonnegut wrote a science fiction story a long time ago where everything in the world was to be equalized. Those ballet dancers that were particularly fleet of foot and could jump particularly high were to be weighted down with lead vests. Of course, the premise revealed the absurdity of the proposition.

If TVA is able to get lower rates without a disadvantage to the taxpayers of this country, there is no advantage in weighing it down just to give it a disadvantage, that it does not naturally have.

Now, on the narrower question of whether or not the taxpayers subsidize the borrowing by TVA through the FFB, it is my understanding of your testimony here that in fact, the taxpayers gain money from TVA's borrowings through the FFB.

I think that is a very important point, Mr. Chairman, because TVA pays a fee to cover all of the taxpayers costs plus a little bit. So if there is an advantage in basis points that comes just from the

fact that TVA is identified in the marketplace as a Government corporation, then that is an advantage that should not be denied to TVA.

If, on the other hand, the committee can identify a taxpayer subsidy of TVA's borrowings, then that is an entirely different proposition. I am sorry to belabor that here at the end of a long day. I think it is a very critical point.

Senator HUMPHREY. Indeed it is. It is an important point. We asked OMB in its testimony on the 30th to give special attention to that point.

Let me go just a little bit further to clarify my own understanding. Did someone say earlier that when TVA borrows from FFB they pay the current cost of borrowing plus an eighth of a point?

Mr. DEAN. That's correct.

Mr. FREEMAN. The Treasury estimates what that issue will be on that day. We are going to be borrowing on the 24th day of July. We have told FFB that we will do so. They will tell us the rate 24 hours in advance, or is it that morning?

Mr. SANGER. Well, it is usually that morning. But it is based on their most recent cost of money. We pay that cost, comparable-term kind of borrowing.

Mr. FREEMAN. Plus one-eighth of 1 percent.

Senator HUMPHREY. What is their basis for cost of money? Is this 180-day paper?

Mr. FREEMAN. No.

Mr. SANGER. No.

Mr. FREEMAN. If we are borrowing a 25-year—

Senator HUMPHREY. They cover it with 180-day notes, don't they?

Mr. FREEMAN. They will give us the rate on the basis of long-term paper, which is, of course, higher than the notes. If it is a 25-year paper, they will estimate what they are going to have to pay to borrow 25-paper. That is what they will charge us.

They may actually make it up with short-term paper. That is up to them.

Mr. SANGER. If the chairman please. There was a time, and there have been times in the market, when they were charging us short-term rates that were disadvantageous to us over the long-term rates. That has changed around now and doesn't exist. But that was occurring for awhile.

Mr. FREEMAN. The rates were inverted.

Senator HUMPHREY. I thank you for the clarification.

Nevertheless, an important issue remains that such access constitutes another lack of accountability, in this case marketplace accountability, on the actions of TVA.

That is an important point; whether or not there constitutes—there is constituted a true subsidy or not.

Thank you very much, gentlemen.

[Whereupon, at 5:15 p.m., the hearing was recessed.]

[Statements and responses to additional questions follow:]

STATEMENT BY CHARLES H. DEAN, JR., CHAIRMAN
TENNESSEE VALLEY AUTHORITY
BEFORE THE SUBCOMMITTEE ON REGIONAL AND COMMUNITY DEVELOPMENT
U. S. SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
WASHINGTON, D.C., JULY 15, 1985

I: GENERAL INTRODUCTION

MR. CHAIRMAN, MEMBERS OF THE COMMITTEE, GOOD AFTERNOON. ON BEHALF OF TVA'S BOARD OF DIRECTORS, LET ME SAY THAT WE ARE GLAD TO HAVE THIS OPPORTUNITY TO TALK ABOUT WHAT TVA IS DOING TO SERVE OUR NATION.

I WISH WE HAD THE CHANCE THIS AFTERNOON TO DRIVE THROUGH THE BEAUTIFUL HILLS NORTH OF KNOXVILLE AND TO VISIT NORRIS DAM--THE FIRST DAM BUILT BY TVA. ON OUR WAY INTO THE POWERHOUSE, WHERE TURBINES TURN THE FORCE OF FLOWING WATER INTO ELECTRICITY, THERE IS AN INSCRIPTION THAT CONTAINS 10 SIMPLE WORDS; "BUILT FOR THE PEOPLE OF THE UNITED STATES OF AMERICA."

THAT SENTIMENT GAVE BIRTH TO THE TENNESSEE VALLEY AUTHORITY MORE THAN 50 YEARS AGO, AND TVA'S PROGRAMS ARE STILL LAUNCHED WITH THAT MOTIVE IN MIND. TVA WAS CREATED TO DO MORE THAN AID ONE OF THE COUNTRY'S MOST IMPOVERISHED REGIONS, IT WAS CREATED TO SERVE THE NATION.

IVA AS A NATIONAL LABORATORY

TVA HAS DONE THIS THROUGH A SERIES OF NATIONAL DEMONSTRATION PROJECTS THAT HAVE PAVED THE WAY FOR REGIONAL AND NATIONAL PROGRESS. FOUR PRESENT-DAY EXAMPLES CAN ILLUSTRATE THIS POINT: EACH WILL BE DISCUSSED IN GREATER DETAIL LATER IN OUR TESTIMONY.

1. THIS NATION'S ABUNDANT COAL RESERVES ARE CURRENTLY ITS PRINCIPAL SOURCE OF ELECTRICITY AND ONE OF ITS CHIEF ASSETS IN TERMS OF ENERGY INDEPENDENCE. A SUBSTANTIAL PORTION OF THOSE RESERVES, HOWEVER, CONTAIN RELATIVELY HIGH LEVELS OF SULFUR. WHEN THIS COAL IS BURNED IN TRADITIONAL BOILERS, EXPENSIVE EMISSION CONTROL EQUIPMENT IS REQUIRED OR ENVIRONMENTAL DISRUPTION RESULTS.

THE TENNESSEE VALLEY AUTHORITY IS A NATIONAL AND INTERNATIONAL LEADER IN THE DEVELOPMENT AND TESTING OF A COMMERCIAL-SCALE COAL-BURNING TECHNOLOGY THAT ELECTRIC UTILITIES ACROSS THE COUNTRY CAN USE TO BURN HIGH-SULFUR COAL CLEANLY AND EFFICIENTLY. IT'S A TECHNOLOGY THAT CAN PUT OUR COAL RESERVES TO WORK, CREATE JOBS, AND KEEP OUR ENVIRONMENT CLEAN--ALL AT

THE SAME TIME. GROUNDBREAKING FOR TVA'S FACILITY USING THIS TECHNOLOGY WILL TAKE PLACE IN SEPTEMBER IN PADUCAH, KENTUCKY. YOU'RE ALL INVITED.

2. PUTTING NATURAL RESOURCES TO WORK HAS ALWAYS BEEN A THEME FOR TVA. ONE OF OUR REGION'S AND NATION'S MOST IMPORTANT RESOURCES IS OUR FARMLAND, AND RIGHT NOW OUR FARMS CAN USE ALL THE HELP THEY CAN GET.

ONE SOURCE OF THAT HELP CAN COME THROUGH NEW AND BETTER FERTILIZERS THAT INCREASE FARM PRODUCTIVITY, SUCH AS THOSE DEVELOPED AT TVA'S NATIONAL FERTILIZER DEVELOPMENT CENTER IN MUSCLE SHOALS, ALABAMA. THIS CENTER HAS BEEN HARNESSING THE MAGIC OF CHEMISTRY FOR ALMOST FIVE DECADES, PIONEERING PRODUCTS AND PROCESSES THAT ARE NOW THE BASIS FOR THREE-FOURTHS OF ALL FERTILIZERS MADE IN AMERICA. THESE FERTILIZERS HAVE HELPED ELEVATE AMERICAN FARM PRODUCTIVITY 40 PERCENT AND ARE HELPING FEED PEOPLE ALL ACROSS THE GLOBE. IF ANYONE HAS ANY DOUBTS ABOUT THIS, LET THEM TALK TO THE LEADERS OF THE FERTILIZER INDUSTRY.

3. NO ONE DOUBTS THAT THIS NATION'S WATERS ARE ONE OF ITS CHIEF ASSETS AND THAT KEEPING THEM CLEAN IS A WELL-ESTABLISHED NATIONAL PRIORITY. TVA, IN COOPERATION WITH THE U.S. ENVIRONMENTAL PROTECTION AGENCY AND OTHERS IN UPPER EAST TENNESSEE, IS HELPING DEVELOP AN INNOVATIVE APPROACH TO ADDRESSING WATER QUALITY PROBLEMS IN OUR NATION'S RIVERS AND STREAMS. THE SO-CALLED "WATER BUBBLE" APPROACH WOULD USE COOPERATIVE COST-SHARING ARRANGEMENTS TO ACHIEVE ECONOMICAL SOLUTIONS TO WATER QUALITY PROBLEMS WHEN MORE THAN ONE CONTRIBUTOR IS INVOLVED. IT'S AN EXPERIMENT IN COST-EFFECTIVE ENVIRONMENTAL PROTECTION, AN EXPERIMENT THAT BENEFITS EVERYONE.

4. FINALLY, THERE'S NOT A REGION IN THIS COUNTRY OF OURS THAT WOULDN'T LIKE TO FIND A WAY TO CREATE THOUSANDS OF PRIVATE SECTOR JOBS IN A WAY THAT DOESN'T REQUIRE LARGE GOVERNMENTAL GRANTS OR DOESN'T SIMPLY ROB JOBS FROM ONE REGION AND SHIP THEM TO ANOTHER.

TVA IS SHOWING HOW THIS CAN BE DONE. IN COOPERATION WITH THE REGION'S 160 ELECTRIC POWER DISTRIBUTORS, WE'RE DELIVERING TECHNICAL ASSISTANCE TO SMALL- AND MEDIUM-SIZED MANUFACTURING FIRMS THAT HAVE THE

POTENTIAL TO EXPAND. IN THE PAST TWO-AND-A-HALF YEARS, SUCH ASSISTANCE HAS HELPED MORE THAN 300 FIRMS MEET THE CHALLENGE OF EXPANSION, CREATING MORE THAN 10,000 GOOD-PAYING JOBS. SEVERAL STATE AND LOCAL ECONOMIC DEVELOPMENT AGENCIES OUTSIDE THE TVA REGION HAVE EXPRESSED INTEREST IN REPLICATING THE PROGRAM IN THEIR SERVICE AREAS.

IN THE AREAS OF ENERGY AND AGRICULTURAL TECHNOLOGY AND IN ENVIRONMENTAL PROTECTION AND ECONOMIC DEVELOPMENT, THE TENNESSEE VALLEY AUTHORITY IS LIVING UP TO ITS CONTINUING MISSION TO AID THE REGION WHILE SERVING THE NATION. IN THE TESTIMONY THAT FOLLOWS, YOU WILL SEE THAT TVA IS TRULY A UNIQUE ORGANIZATION. IT'S NOT JUST A FEDERALLY-CONTROLLED UTILITY, NOT JUST AN ECONOMIC DEVELOPMENT AGENCY, AND NOT JUST AN AGENCY FOR THE PROMOTION OF SOUND NATURAL RESOURCE POLICIES--BUT IT'S ALL OF THESE ROLLED INTO ONE.

IN JUDGING THIS AGENCY, WE ASK THAT YOU CONSIDER NOT JUST ONE PART OF TVA, BUT TVA AS A WHOLE. AND, ABOVE ALL, WE ASK THAT YOU CONSIDER NOT SIMPLY WHAT TVA DOES FOR ITS REGION, BUT WHAT IT DOES FOR OUR NATION.

II: TVA'S SELF-FINANCED POWER SYSTEM

AT TVA, WE OFTEN SAY THAT WE'RE MORE THAN AN ELECTRIC UTILITY--AND THAT'S TRUE. BUT WE DO OPERATE THE NATION'S LARGEST ELECTRIC POWER SYSTEM, SERVING ABOUT 2.8 MILLION CUSTOMERS WITH ANNUAL REVENUES IN EXCESS OF \$4.5 BILLION. AND ON MOST MEASURES OF OVERALL PERFORMANCE, TVA'S POWER SYSTEM RANKS AMONG THE TOP IN THE COUNTRY. ITS POWER SYSTEM IS GENERALLY WELL-OPERATED, AND IT IS SELF-FINANCING.

TVA'S POWER SYSTEM HASN'T DEPENDED ON CONGRESSIONAL APPROPRIATIONS FOR MORE THAN 25 YEARS. IN FACT, THE POWER SYSTEM IS NOW EARNING DIVIDENDS FOR AMERICAN TAXPAYERS AND IS RETURNING MONEY TO THE U.S. TREASURY EACH YEAR, NOT TAKING IT OUT. IT HAS BEEN DOING SO SINCE 1961.

BEFORE THE TVA POWER SYSTEM BECAME SELF-FINANCING, CONGRESSIONAL APPROPRIATIONS WERE USED TO BUILD TVA'S DAMS AND COAL-FIRED STEAM PLANTS. UNDER THOSE ARRANGEMENTS, A FEDERAL INVESTMENT OF \$1.4 BILLION WAS ACCUMULATED.

THE SELF-FINANCING ACT OF 1959 ESTABLISHED THE FRAMEWORK FOR A FINANCIALLY INDEPENDENT POWER SYSTEM FOR TVA AND REQUIRED THE AGENCY TO MAKE AN ANNUAL REPAYMENT ON PREVIOUS FEDERAL INVESTMENTS ALONG WITH AN ANNUAL RETURN ON THE NET INVESTMENT IN POWER FACILITIES. THIS AMOUNTS TO PAYING BACK THE EQUITY

AND GIVING THE U.S. TREASURY A GUARANTEED DIVIDEND ON ITS INVESTMENT. BY THE END OF 1984, TVA HAD PAID INTO THE U.S. TREASURY A TOTAL OF \$1.9 BILLION.

LAST YEAR, TVA WROTE CHECKS FROM ITS POWER REVENUES TO THE FEDERAL TREASURY FOR \$113 MILLION. OF THAT AMOUNT, \$20 MILLION WAS APPLIED TO THE REPAYMENT OF PREVIOUS FEDERAL INVESTMENTS. MORE THAN \$93 MILLION WENT TO PAY A RETURN ON THOSE INVESTMENTS, A RETURN WHICH IS COMPUTED ANNUALLY USING THE CURRENT COST OF MONEY TO THE U.S. TREASURY.

PAYING A RATE OF RETURN BASED ON THE CURRENT COST OF MONEY IS A STRINGENT FINANCIAL REQUIREMENT COMPARED TO SIMILAR PROVISIONS FOR OTHER FEDERAL AGENCIES. RATHER THAN REPAYING THE FEDERAL INVESTMENT OVER TIME WITH THIS VARIABLE RATE OF RETURN, SUPPOSE THAT TVA HAD BEEN DIRECTED BY CONGRESS TO BUY OUT THE EXISTING FEDERAL INVESTMENT AS OF 1960 BY SELLING BONDS. TVA POWER BONDS AT THAT TIME WERE SELLING IN THE WALL STREET MARKET AT AN INTEREST RATE OF 4.4 PERCENT. UNDER A 25-YEAR BOND ISSUE, TVA WOULD HAVE PAID SOME \$400 MILLION LESS IN INTEREST TO BONDHOLDERS THAN IT HAS PAID THE TREASURY AS A RETURN ON THE FEDERAL INVESTMENT. THIS WOULD AMOUNT TO A SAVINGS OF ABOUT 28 PERCENT.

FROM THESE COMPARISONS IT IS CLEAR THAT TVA'S RATEPAYERS

ARE NOT BEING SUBSIDIZED AS A RESULT OF THE FEDERAL INVESTMENT IN THE TVA POWER SYSTEM PRIOR TO 1959. IF ANYTHING, TVA'S POWER SYSTEM IS PAYING MORE AND PUTTING UNPLANNED REVENUES INTO THE U.S. TREASURY.

THE REMAINING PERCENTAGE OF FEDERAL INVESTMENT IN THE TVA POWER SYSTEM HAS DECLINED TO A POINT WHERE CONGRESSIONAL APPROPRIATIONS NOW REPRESENT LESS THAN SIX PERCENT OF THE CAPITAL STRUCTURE OF THE POWER SYSTEM.

NOT ONLY IS TVA'S POWER SYSTEM PROVING ITSELF TO BE A FINANCIAL ASSET TO THE U.S. TREASURY, IT'S A CONTINUING ASSET TO THE PEOPLE AND TO THE INDUSTRIES OF THE TENNESSEE VALLEY REGION. TRADITIONALLY, TVA'S RESIDENTIAL RATES ARE AMONG THE LOWEST IN THE NATION. YOU CAN SEE THIS COMPARISON ON CHART ONE LOCATED IN THE APPENDIX. CHART TWO SHOWS THAT OUR COMMERCIAL AND INDUSTRIAL RATES ARE TYPICALLY COMPETITIVE WITH NEIGHBORING UTILITIES.

THESE ADVANTAGES HAVE BEEN GAINED NOT THROUGH TAXPAYER SUBSIDIES BUT THROUGH CAREFUL MANAGEMENT AND EFFICIENT OPERATIONS OF THE REGION'S RESOURCES. OUR COAL-FIRED PLANTS ARE AMONG THE MOST EFFICIENT IN THE NATION AND OUR HYDROPOWER FACILITIES ARE ALSO AMONG THE COUNTRY'S MOST ECONOMICAL POWER SOURCES.

BUT WE ARE HAVING PROBLEMS IN OUR NUCLEAR POWER PROGRAM.

ALL THREE UNITS AT OUR BROWNS FERRY PLANT ARE SHUT DOWN AND WILL NOT BE BROUGHT BACK ONLINE UNTIL TVA'S MANAGEMENT CONVINCES THE BOARD THAT THE UNITS ARE READY AND REASONABLY SAFE TO OPERATE. WE OPERATE WITH A "SAFETY FIRST" POLICY THAT DICTATES SAFETY MUST BE THE PRIMARY CONSIDERATION; IF A CHOICE HAS TO BE MADE BETWEEN SAFETY AND GENERATING KILOWATTHOURS, OUR OPERATORS AND MANAGERS ARE INSTRUCTED TO CHOOSE SAFETY EVERY TIME. WE BELIEVE THE PEOPLE WHO USE TVA POWER WANT IT THAT WAY.

ALSO ON THE NUCLEAR FRONT, WE HAVE ANOTHER PROBLEM AT TVA. WE HAVE ONE OF THE FINEST TRAINING PROGRAMS FOR NUCLEAR REACTOR OPERATORS IN THE COUNTRY. AND WE'RE PROUD OF THAT. BUT TVA HAS BEEN A TRAINING GROUND FOR NUCLEAR OPERATORS AND MANAGERS FOR ANOTHER REASON. AFTER SEVERAL YEARS EXPERIENCE --JUST WHEN THEY'RE REACHING THEIR FULL PROFESSIONAL LEVEL OF PERFORMANCE-- OUR SENIOR NUCLEAR OPERATORS AND MANAGERS START RUNNING UP AGAINST SALARY LIMITATIONS THAT ARE TIED TO THE FEDERAL PAY CAP. THE RESULTS ARE PREDICTABLE --TOO MANY LEAVE FOR OTHER UTILITIES.

TO ILLUSTRATE, SIX OF OUR TOP NUCLEAR MANAGERS HAVE LEFT TO HEAD THE NUCLEAR PROGRAMS OR RUN KEY PLANTS OF INVESTOR-OWNED UTILITIES AT SOME TIMES TWICE THE COMPENSATION TVA IS PERMITTED TO PAY. IN ADDITION, WE HAVE LOST A SIGNIFICANT NUMBER OF OUR MOST ABLE MIDDLE MANAGERS TO OTHER UTILITIES. THESE ARE THE VERY MANAGERS WHO WOULD BE IN LINE TO FILL TOP VACANCIES.

THIS "BRAIN DRAIN" HAS BROUGHT OUR NUCLEAR PROGRAM TO A MANAGEMENT CRISIS. WE ARE SO THIN IN MANAGEMENT CAPABILITY THAT WE HAVE SEVERE DOUBTS OF OUR ABILITY TO FINISH CONSTRUCTION ON TWO PLANTS -ONE OF WHICH IS NEARLY READY FOR OPERATION. FURTHERMORE, THIS MANAGEMENT CRISIS JEOPARDIZES PUBLIC CONFIDENCE IN OUR COMMITMENT TO OPERATE TVA'S NUCLEAR PLANTS SAFELY AND THREATENS OUR ABILITY TO MEET THE DEMAND FOR ELECTRICITY AT A REASONABLE COST.

DESPITE THESE DIFFICULTIES, TVA'S OVERALL POWER SYSTEM--WHICH DEPENDS ON NUCLEAR GENERATION FOR ABOUT 18 PERCENT OF ITS CAPACITY--IS GENERALLY IN GOOD SHAPE. WE'RE FINANCIALLY SOUND. WE'VE BEEN ABLE TO CANCEL UNNEEDED NUCLEAR UNITS AND DEVELOP FINANCIAL MEASURES FOR ABSORBING THE LOSS WITHOUT CREATING SHARP RATE INCREASES. WE'VE COMPLETED THE MOST EXTENSIVE REORGANIZATION OF OUR POWER AND ENGINEERING STAFFS IN TVA'S HISTORY, INCLUDING FURTHER REALIGNMENTS IN NUCLEAR POWER RESPONSIBILITIES MADE JUST RECENTLY. AND WE'VE KEPT RATES RELATIVELY STABLE, ALTHOUGH IT NOW LOOKS AS IF RATES WILL GO UP IN OCTOBER FOR THE FIRST TIME IN THREE YEARS.

ALSO AS A POWER SYSTEM, WE'RE DOING WHAT WE CAN TO ENCOURAGE ECONOMIC DEVELOPMENT WITHIN THE REGION AND TO KEEP OUR ENVIRONMENT AS CLEAN AS POSSIBLE. THESE TWO OBJECTIVES ARE AN IMPORTANT PART OF TVA'S OVERALL MISSION. BRINGING THEM TO YOUR ATTENTION GIVES ME ANOTHER CHANCE TO EMPHASIZE THAT THE

TVA POWER SYSTEM NEEDS TO BE JUDGED BOTH ON ITS OWN MERITS AND ON ITS CONTRIBUTIONS TO THE BROADER PURPOSES OF THE AGENCY.

TVA'S POWER SYSTEM AND THE ENVIRONMENT

BEFORE A SIX-YEAR, BILLION DOLLAR ENVIRONMENTAL CLEANUP, TVA'S COAL-FIRED POWER PLANTS WERE RELEASING OVER TWO MILLION TONS OF SULFUR DIOXIDE INTO THE ATMOSPHERE EACH YEAR-- JEOPARDIZING AIR AND WATER QUALITY NOT ONLY IN THE TENNESSEE VALLEY REGION BUT ALL ALONG THE EASTERN SEABOARD AND UP INTO NEW ENGLAND.

FORTUNATELY, THOSE DARK DAYS ARE BEHIND US. NOW, NOT ONLY IS TVA AN ENVIRONMENTAL LEADER, IT HAS HELPED DEMONSTRATE TO ELECTRIC UTILITIES ACROSS THE COUNTRY THAT MASSIVE REDUCTIONS IN AIR POLLUTION CAN BE ACHIEVED WITHOUT EQUALLY MASSIVE RATE INCREASES.

DURING A SIX-YEAR PERIOD, WE REDUCED OUR POLLUTING EMISSIONS BY MORE THAN HALF--TO LESS THAN 1 MILLION TONS--BY INSTALLING SCRUBBERS, PRECIPITATORS AND BAGHOUSES, BY BUILDING TWO COAL-WASHING FACILITIES AND BY SWITCHING TO SOME LOWER-SULFUR COAL. AT EACH PLANT WE PURSUED THE LEAST-COST OPTION FOR MEETING ENVIRONMENTAL GOALS. WHILE THE OVERALL COST OF MEETING THESE GOALS PROVED TO BE SUBSTANTIAL--ABOUT \$400 MILLION PER YEAR--IT REPRESENTS ONLY ABOUT 9 PERCENT OF PRESENT

POWER SYSTEM REVENUES. THIS ENVIRONMENTAL CAMPAIGN WAS PAID FOR BY THE RATEPAYERS OF TVA WITHOUT A BAIL OUT OR FEDERAL SUBSIDY OF ANY SORT.

AS MENTIONED EARLIER, WE'RE ALSO LEADING THE WAY TO A NEW ERA IN THE ELECTRIC UTILITY BUSINESS WITH THE DEVELOPMENT AND TESTING OF A COMMERCIAL-SCALE ATMOSPHERIC FLUIDIZED BED COMBUSTION (AFBC) BOILER. THIS TECHNOLOGY CAN BURN COAL MORE CLEANLY AND EFFICIENTLY, AND AT A LOWER COST THAN TRADITIONAL BOILERS EQUIPPED WITH POLLUTION CONTROL DEVICES REQUIRED FOR NEW POWER PLANTS.

WITH A CONSIDERABLE AMOUNT OF IMAGINATION AND ENERGY, AND WITH THE JOINT SUPPORT OF CONGRESS AND TVA RATEPAYERS, TVA BUILT A 20-MEGAWATT AFBC PLANT, AND HAS OPERATED IT FOR TWO YEARS WITH BEAUTIFUL RESULTS.

NOW, WITH THE HELP OF CONGRESS, TVA POWER REVENUES, THE ELECTRIC POWER RESEARCH INSTITUTE, AND SEVERAL-OTHER SUPPORTERS, GROUNDBREAKING FOR A COMMERCIAL-SCALE 160-MEGAWATT AFBC PLANT WILL TAKE PLACE LATER THIS SUMMER. THIS WILL BE THE FIRST PLANT OF ITS KIND IN THE NATION AND THE WORLD.

OF THE \$214 MILLION ALREADY PLEDGED FOR THE CONSTRUCTION AND TESTING OF TVA'S COMMERCIAL-SCALE FACILITY, \$40 MILLION HAS BEEN PLEDGED BY TVA, \$75 MILLION BY THE ELECTRIC POWER RESEARCH INSTITUTE, ALMOST \$18 MILLION BY COMBUSTION ENGINEERING,

\$6 MILLION BY FLUOR AND \$10 MILLION EACH BY THE COMMONWEALTH OF KENTUCKY AND DUKE POWER COMPANY. AN ADDITIONAL \$45 MILLION HAS BEEN PLEDGED FROM A NUMBER OF ELECTRIC UTILITIES AND PRIVATE CORPORATIONS THROUGHOUT THE NATION, AND THE U.S. CONGRESS HAS PROVIDED \$30 MILLION TO THE DEPARTMENT OF ENERGY FOR TRANSFER TO THIS PROJECT.

THIS TYPE OF FINANCIAL COOPERATION AND COST-SHARING AMONG PRIVATE AND PUBLIC AGENCIES TYPIFIES PROGRAMS THROUGHOUT TVA AND DEMONSTRATES AN APPROPRIATE FEDERAL ROLE IN THE RESEARCH AND DEVELOPMENT OF PROMISING ENERGY-RELATED TECHNOLOGIES.

PART OF THE BEAUTY OF THIS PARTICULAR TECHNOLOGY IS THAT IT ENABLES A GREATER USE OF OUR ABUNDANT COAL RESOURCES, EVEN THOSE PORTIONS WITH HIGH-SULFUR LEVELS, WHILE THE ENVIRONMENT REMAINS PROTECTED. BY BURNING CRUSHED COAL IN A SWIRLING MIXTURE WITH CRUSHED LIMESTONE SUPPORTED BY A BED OF FORCED AIR, THE SULFUR DIOXIDE NORMALLY RELEASED DURING COAL COMBUSTION IS TRAPPED BY THE LIMESTONE AND DROPS OUT AS AN ENVIRONMENTALLY BENIGN ASH. BECAUSE THIS TYPE OF BOILER IS ABLE TO OPERATE AT LOWER TEMPERATURES, THE RELEASE OF NITROGEN OXIDES IS ALSO REDUCED.

USING OUR COAL AS A CLEAN AND EFFICIENT SOURCE OF ELECTRIC ENERGY WILL ALSO HELP TO FUEL THE REGIONAL AND NATIONAL ECONOMY BY CREATING JOBS IN DEPRESSED COAL FIELDS. THE CONNECTION

BETWEEN THE PRODUCTION AND DISTRIBUTION OF ENERGY AND ITS IMPACT ON OUR ECONOMY HAS BEEN, AND CONTINUES TO BE, OF CRUCIAL INTEREST TO TVA.

TVA'S POWER SYSTEM AND THE ECONOMY

TODAY'S HIGHER ENERGY COSTS AND FOREIGN COMPETITION HAVE CREATED SERIOUS PROBLEMS FOR SOME INDUSTRIES THAT REQUIRE LARGE AMOUNTS OF ELECTRICITY. IN THE PAST TWO YEARS, TVA HAS BEEN OFFERING ELECTRICITY TO ITS LARGER INDUSTRIAL USERS UNDER CERTAIN CONDITIONS THAT ALLOW TVA TO SELL THEM POWER AT A DISCOUNT RATE. SUCH CUSTOMERS CAN SAVE UP TO 30 PERCENT OF THEIR ENERGY CHARGES BY BUYING POWER THAT IS TEMPORARILY AVAILABLE AND IS NOT DEMANDED BY OTHER USERS. THIS SUPPLY CAN BE INTERRUPTED WHEN NEEDED TO MEET THE REQUIREMENTS OF OTHER USERS OF ELECTRICITY. UNDER CURRENT AGREEMENTS, SUCH INTERRUPTIONS CAN ONLY TAKE PLACE A LIMITED NUMBER OF TIMES PER YEAR AND FOR A LIMITED NUMBER OF DAYS.

THIS TYPE OF ARRANGEMENT, KNOWN AS LIMITED INTERRUPTIBLE POWER, HELPS TVA USE ITS ELECTRIC GENERATING CAPACITY FULLY AND HELPS MANY OF THE INDUSTRIES WE SERVE REMAIN PROFITABLE IN AN INCREASINGLY COMPETITIVE NATIONAL AND INTERNATIONAL MARKETPLACE.

A BLOCK OF 600 MEGAWATTS OF LIMITED INTERRUPTIBLE POWER WAS ORIGINALLY OFFERED TWO YEARS AGO. THAT AMOUNT HAS BEEN

RECENTLY INCREASED TO 1,000 MEGAWATTS TO MEET INCREASING CUSTOMER DEMAND. TO GIVE YOU AN IDEA OF WHAT WE'RE TALKING ABOUT, 1,000 MEGAWATTS IS ENOUGH ELECTRIC CAPACITY TO SERVE A CITY LIKE KNOXVILLE, TENNESSEE, WITH OVER 100,000 CUSTOMERS, ON A VERY COLD MORNING.

ENERGY CONSERVATION AND RENEWABLES

THE REGION'S ECONOMY HAS ALSO BENEFITED FROM TVA'S ENERGY CONSERVATION EFFORTS WHICH ARE SAVING CONSUMERS ABOUT 2.4 BILLION KILOWATTHOURS ANNUALLY, OR ABOUT \$116 MILLION A YEAR. FURTHERMORE, WE ESTIMATE THAT ENERGY CONSERVATION AND LOAD MANAGEMENT PROGRAMS COULD SAVE THE POWER SYSTEM \$3.5 BILLION IN OPERATING AND POWER PLANT CONSTRUCTION COSTS BY THE TURN OF THE CENTURY.

THESE ARE THE KINDS OF SAVINGS THAT MAKE A REAL DIFFERENCE TO THE REGION'S POWER CONSUMERS AND TO TVA ITSELF. BUT THERE IS A DOUBLE PAYOFF WITH ENERGY CONSERVATION. AS WE BURN LESS COAL AND NEED LESS URANIUM, WE REDUCE THE ENVIRONMENTAL BURDEN OF OUR ENERGY SYSTEM. CONSUMERS BENEFIT RIGHT ALONG WITH THE ENVIRONMENT.

TVA'S ENERGY CONSERVATION PROGRAM IS ONE OF THE NATION'S MOST AMBITIOUS AND MOST EFFECTIVE. A VARIETY OF SERVICES ARE AVAILABLE INCLUDING THE ENERGY PACKAGE FOR EXISTING HOMES,

ENERGY CONSERVATION AND SOLAR ENERGY FOR NEW HOMES, PASSIVE SOLAR RETROFITS, CONSUMER OUTREACH PROJECTS AND SPECIAL INITIATIVES TO HELP LOW-INCOME CONSUMERS.

THE RESIDENTIAL ENERGY PACKAGE, AVAILABLE THROUGH PARTICIPATING DISTRIBUTORS OF TVA POWER, INCLUDES A FREE HOME SURVEY AND INSPECTION ALONG WITH INTEREST-FREE AND LOW-INTEREST LOANS TO HELP FINANCE ENERGY CONSERVATION MEASURES. AT THE OPTION OF THE DISTRIBUTORS, THE PACKAGE MAY INCLUDE HOME WEATHERIZATION MEASURES, HEAT PUMPS, HEAT PUMP WATER HEATERS, SOLAR WATER HEATERS, AND WOOD HEATERS.

LAST YEAR ALONE (FY 1984), MORE THAN 89,000 RESIDENTIAL CONSUMERS TOOK ADVANTAGE OF SOME COMPONENT OF THE ENERGY PACKAGE. ALTOGETHER, PARTS OF THIS PACKAGE HAVE REACHED INTO ALMOST A MILLION HOMES IN THE VALLEY REGION.

AS A RESULT OF SPECIAL OUTREACH AND COMMUNICATIONS EFFORTS, LOW-INCOME PARTICIPATION IN TVA'S HOME WEATHERIZATION SERVICES HAS INCREASED DRAMATICALLY. IN FACT, ALMOST 40 PERCENT OF ALL LIVING UNITS WEATHERIZED IN THIS PAST FISCAL YEAR WERE OCCUPIED BY FAMILIES CLASSIFIED AS LOW INCOME. HELPING THESE PEOPLE CONTROL THEIR ENERGY COSTS IS AN IMPORTANT GOAL FOR TVA.

IN ADDITION TO INCREASING ENERGY EFFICIENCY IN EXISTING HOMES, TVA ALSO PROMOTES THE CONSTRUCTION OF ENERGY-EFFICIENT HOMES AND THE USE OF SOLAR ENERGY IN NEW HOMES. AT THE END OF FISCAL YEAR 1984, 8,795 HOMES HAD BEEN CERTIFIED UNDER THE TVA ENERGY SAVER HOME PROGRAM, AND MORE THAN 4,500 OTHERS WERE UNDER CONSTRUCTION.

SINCE MORE THAN HALF OF ALL TVA POWER IS USED BY THE COMMERCIAL AND INDUSTRIAL SECTOR, ENERGY SAVINGS IN THIS AREA ARE CRITICAL TO ACHIEVING TVA'S OVERALL ENERGY CONSERVATION GOAL. ENERGY CONSERVATION SERVICES AVAILABLE FOR COMMERCIAL AND INDUSTRIAL POWER USERS INCLUDE ONSITE ENERGY EVALUATIONS FOR EXISTING FACILITIES AND ENERGY-EFFICIENT DESIGN ASSISTANCE FOR NEW ONES. MORE THAN 18,500 COMMERCIAL AND INDUSTRIAL BUILDINGS COVERING SOME 395 MILLION SQUARE FEET OF FLOOR SPACE HAVE BEEN SURVEYED THROUGH THIS PROGRAM, WITH THESE SURVEYS IDENTIFYING POTENTIAL SAVINGS OF MORE THAN A BILLION KILOWATTHOURS. TVA HAS PROVIDED MORE THAN \$2.5 MILLION IN LOANS TO INDUSTRIAL CONSUMERS TO INSTALL VARIOUS ELECTRICAL ENERGY-SAVING MEASURES.

ANOTHER IMPORTANT ASPECT OF OF TVA'S ENERGY CONSERVATION EFFORT IS THE USE OF RENEWABLE SOURCES OF ENERGY. THROUGH TVA ASSISTANCE MORE THAN 5,000 SOLAR WATER HEATERS AND 5,000 WOOD HEATERS HAD BEEN INSTALLED IN VALLEY HOMES AS OF SEPTEMBER 1984. TVA IS ALSO MAKING TECHNICAL AND FINANCIAL ASSISTANCE AVAILABLE TO ITS COMMERCIAL AND INDUSTRIAL CUSTOMERS TO ENCOURAGE THEIR USE OF ENERGY FROM THE SUN AND THE REGION'S ABUNDANT WOODS.

WHEN MOST OF US THINK ABOUT ENERGY FROM WOOD, WE THINK ABOUT BURNING WOOD FOR HEATING OR COOKING. BUT WOOD, AS WELL AS OTHER PLANT MATERIALS, CAN BE CONVERTED THROUGH FERMENTATION INTO LIQUID FUELS.

A RECENTLY COMPLETED ASSESSMENT BY TVA CONCLUDED THAT 25 MILLION (GREEN) TONS OF WOOD ARE AVAILABLE IN THE VALLEY FOR USE AS FUEL, AND CAN BE USED WITHOUT DISTURBING THE ENVIRONMENT OR THE TIMBER INDUSTRY. ONE-HALF OF THIS AMOUNT COULD REPLACE ONE-THIRD OF THE OIL AND GAS CURRENTLY CONSUMED BY INDUSTRIES OF THE REGION FOR SPACE AND PROCESS HEAT. THE OTHER HALF COULD BE CONVERTED TO LIQUID FUEL, REPLACING ONE-FIFTH OF THE REGION'S AUTOMOBILE FUEL NEEDS.

NOT ONLY IS THIS POSSIBLE, TVA IS DEVELOPING AND TESTING THE TECHNOLOGIES THAT WILL ALLOW THE POSSIBILITY TO BECOME A REALITY. WE ARE CONSTRUCTING A TWO-TON-PER-DAY ETHANOL-FROM-WOOD PLANT ON TVA'S MUSCLE SHOALS RESERVATION. OUR SCIENTISTS ARE EXPLORING WAYS TO CONVERT MORE OF THE WOOD TO SUGARS FOR FERMENTATION THAN ARE CONVERTED USING TRADITIONAL TECHNOLOGIES IN THIS AREA, WITH THESE IMPROVEMENTS ALCOHOL YIELDS COULD BE IMPROVED BY AS MUCH AS 50 PERCENT.

LIQUID FUELS CAN ALSO COME FROM CROPS LIKE CORN, WHEAT, BARLEY, SORGHUM, AND POTATOES. AND WITH A NEW PROCESS DEVELOPED BY TVA, ETHANOL CAN BE PRODUCED FROM CORN STALKS, WHEAT STRAW AND GRASS-TYPE CROPS. USING THESE TECHNIQUES, 10 TO 20 PERCENT OF A FARM'S CROPLAND COULD SUPPLY THE COMPLETE FUEL NEEDS OF THE AVERAGE FARM. IN OTHER WORDS, SOME FARMERS COULD GROW THEIR OWN FUEL.

BOTH IN TERMS OF HARDWOOD AND FARM CROPS, TVA IS DEVELOPING AND TESTING FUEL PRODUCING TECHNOLOGIES THAT WILL BENEFIT NOT JUST THE REGION, BUT THE NATION.

ENCOURAGING ENERGY CONSERVATION AND THE USE OF RENEWABLE SOURCES OF ENERGY IS A VITAL MISSION FOR THE TENNESSEE VALLEY AUTHORITY. WE'VE ALREADY POINTED OUT THAT IT MAKES GOOD ECONOMIC AND GOOD ENERGY SENSE. WE ALSO WANT TO EMPHASIZE THAT IT CAN PLAY A MAJOR ROLE IN HELPING THIS COUNTRY ACHIEVE ENERGY INDEPENDENCE.

ENERGY RESEARCH AND DEVELOPMENT

JUST AS INVESTMENTS IN ENERGY CONSERVATION AND RENEWABLE ENERGY SOURCES HAVE PROVEN THEIR VALUE TO ELECTRIC UTILITIES, SO HAVE INVESTMENTS IN ENERGY-RELATED RESEARCH AND DEVELOPMENT.

IN THE AREA OF R&D, TVA IS LEADING THE NATION--AND THE WORLD--IN THE COMMERCIAL TESTING OF THE ATMOSPHERIC FLUIDIZED BED COMBUSTION (AFBC) BOILER FOR USE BY ELECTRIC UTILITIES. TVA IS ALSO A RECOGNIZED LEADER IN "SCRUBBER" TECHNOLOGIES THAT HELP CLEAN EMISSIONS FROM COAL-FIRED STEAMPLANTS. CHEMICAL ADDITIVES, WHICH TVA DEVELOPED, ARE NOW USED IN SCRUBBER INSTALLATIONS ACROSS THE COUNTRY. AND TVA IS RECOGNIZED AS A PIONEER IN ADAPTING THE DRY SCRUBBER TECHNOLOGY--ORIGINALLY

DESIGNED FOR USE WITH LOW SULFUR COALS--TO FACILITIES THAT BURN HIGH-SULFUR COAL. ONCE PROVEN, THIS TECHNOLOGY, WHICH IS MORE COST-EFFICIENT THAN THE WET SCRUBBER, CAN BE APPLIED TO BOILERS BURNING THE MORE ABUNDANT, EASTERN, HIGH-SULFUR COAL. THIS TYPE OF RESEARCH HELPS ELECTRIC UTILITIES THROUGHOUT THE COUNTRY RESPOND TO A PRESSING ENVIRONMENTAL CHALLENGE.

WITH THE SUPPORT OF ELECTRIC POWER RESEARCH INSTITUTE (EPRI), TVA IS ALSO DEVELOPING AND TESTING SUPPORT SYSTEMS AND BATTERIES FOR ELECTRIC VEHICLES WHICH MAY HOLD AN IMPORTANT KEY TO MEETING THE NATION'S FUTURE TRANSPORTATION AND ENERGY NEEDS.

OVERALL, THE EMPHASIS OF TVA'S ENERGY-RELATED RESEARCH AND DEVELOPMENT WORK IS ON TECHNOLOGIES FOR PROVIDING ELECTRICITY IN AN ENVIRONMENTALLY ACCEPTABLE MANNER, ON AVAILABLE OPTIONS TO CENTRAL STATION GENERATING CAPACITY, AND ON REDUCING OPERATING COSTS OF FOSSIL AND NUCLEAR FACILITIES.

FOR FISCAL YEARS 1981 THROUGH 1984, R&D EXPENDITURES AVERAGED 1.33 PERCENT OF GROSS POWER REVENUES. FOR FISCAL YEAR 1985, THAT PERCENTAGE IS ESTIMATED TO BE 1.2, A LEVEL WHICH IS ABOUT TWICE THAT OF OTHER UTILITIES BELONGING TO THE ELECTRIC POWER RESEARCH INSTITUTE AND ABOUT SIX TIMES THAT OF UTILITIES THAT DO NOT BELONG.

TVA'S ENERGY-RELATED R&D, AS WELL AS ITS INNOVATIVE LOAD MANAGEMENT AND ENERGY CONSERVATION PROGRAMS, ARE EXAMPLES OF

SUCCESSFUL OPERATIONS THAT WILL HELP KEEP TVA'S POWER SYSTEM IN GOOD SHAPE TO SERVE THE TENNESSEE VALLEY REGION WELL INTO THE 21ST CENTURY.

BUT TVA'S POWER SYSTEM IS TO BE JUDGED ON ITS CONTRIBUTIONS TO THE NATION, AS WELL AS ITS SERVICE TO THE REGION. AND WE THINK THIS JUDGMENT WILL BE POSITIVE WHEN TVA'S CONTRIBUTION TO ENERGY RESEARCH AND DEVELOPMENT IS CONSIDERED, WHEN ITS EFFORTS IN THE AREA OF ENERGY CONSERVATION AND RENEWABLES IS CONSIDERED, WHEN ITS CONTRIBUTION TO A CLEANER ENVIRONMENT AND MORE VITAL ECONOMY IS CONSIDERED, AND WHEN ITS FINANCIAL SOUNDNESS AND SELF-SUFFICIENCY IS CONSIDERED. WHEN THESE ARE TAKEN INTO ACCOUNT, WE FULLY BELIEVE THAT TVA STANDS UP TO THE CHALLENGE INSCRIBED ON NORRIS DAM, AND ALL OF TVA'S DAMS, "BUILT FOR THE PEOPLE OF THE UNITED STATES OF AMERICA."

III: REGIONAL INTEGRATED RESOURCE DEVELOPMENT

MORE COULD BE SAID ABOUT TVA'S POWER SYSTEM AND THE ROLE IT PLAYS IN THE REGION AND THE NATION, BUT IT'S TIME TO ESTABLISH WITH MORE DETAIL AND CLARITY THE DIMENSIONS OF THE TENNESSEE VALLEY AUTHORITY'S LARGER MISSION. WE CAN DO SO BY FIRST

EXPLORING TVA'S INITIATIVES IN THE DEVELOPMENT AND PROTECTION OF THE REGION'S NATURAL RESOURCES AND THEN BY TURNING TO THE AGENCY'S COOPERATIVE ECONOMIC AND COMMUNITY DEVELOPMENT PROGRAMS WHICH, LIKE OTHER ASPECTS OF TVA, ARE PAYING REAL DIVIDENDS TO THE NATION, AS WELL AS THE REGION.

OUR NATION IS BLESSED WITH AN ABUNDANCE OF NATURAL RESOURCES --THE TENNESSEE VALLEY REGION PARTICULARLY SO. BUT THESE RESOURCES HAVE OFTEN BEEN ABUSED. WHEN TVA WAS CREATED IN 1933, THE CONSEQUENCES OF THAT ABUSE COULD BE SEEN ON THE FACE OF THE LAND AND ON THE FACES OF THE REGION'S PEOPLE. THE TENNESSEE VALLEY HAD SOME OF THE MOST ABUSED AND NEGLECTED LAND AND WATER IN THE UNITED STATES, AND DUE IN NO SMALL PART TO THIS FACT, INCOME LEVELS IN THE TENNESSEE VALLEY STOOD AT LESS THAN HALF THE NATIONAL AVERAGE.

THE TENNESSEE VALLEY AUTHORITY WAS ESTABLISHED AS A REALIZATION OF THE DREAM OF THE "PRAIRIE REPUBLICAN," SENATOR GEORGE NORRIS, TO HELP CORRECT THAT NEGLECT AND ABUSE AND TO SERVE AS A NATIONAL MODEL FOR DOING SO. AND THERE IS AMPLE EVIDENCE THAT TVA HAS BEEN DOING BOTH.

O TVA IS HELPING THE REGION AND NATION SAVE ITS SOILS BY PROMOTING PROPER LAND MANAGEMENT AND ENRICH THEM THROUGH CHEMICAL NUTRIENTS.

- 0 TVA IS SERVING AS A NATIONAL DEMONSTRATION OF MULTIPURPOSE WATERWAY DEVELOPMENT THROUGH ITS DAMS AND RESERVOIRS AND THROUGH FLOOD ZONE MANAGEMENT IN THOSE AREAS WHERE DAMS AND RESERVOIRS ARE AN UNWISE INVESTMENT ECONOMICALLY AND ENVIRONMENTALLY.
- 0 TVA IS AT THE FOREFRONT OF DEVELOPING AND TESTING NEW TECHNOLOGIES AND APPROACHES THAT ADDRESS VARIOUS WATER QUALITY PROBLEMS.
- 0 TVA CONTINUES TO DEMONSTRATE NEW APPROACHES TO THE RECLAMATION OF ABANDONED COAL MINE LANDS, APPROACHES THAT FIND APPLICATION OUTSIDE THE VALLEY REGION.
- 0 TVA'S INNOVATIVE ENVIRONMENTAL EDUCATION EFFORTS ARE HELPING TO TRAIN THE NATION'S YOUTH AND ADULTS AT THE LAND BETWEEN THE LAKES, AND THE AGENCY'S UNIVERSITY-BASED ENVIRONMENTAL AND ENERGY EDUCATION CENTERS ARE BEING REPLICATED IN OTHER STATES.
- 0 AND, MOST ESPECIALLY, TVA CONTINUES TO SERVE AS A NATIONAL EXPERIMENT IN REGIONAL, INTEGRATED RESOURCE DEVELOPMENT.

TVA, AS AN EXPERIMENT, WAS ESTABLISHED WITH AN ENTIRE WATERSHED AS ITS CRUCIBLE --A WATERSHED STRETCHING INTO SEVEN STATES AND ENCOMPASSING MORE THAN A HUNDRED COUNTIES AND EVEN MORE VILLAGES, TOWNS, AND CITIES. THE OBJECT OF THE EXPERIMENT WAS TO TEST THE PROPOSITION THAT A REGION'S LIFE SUSTAINING RESOURCES OF LAND, WATER AND AIR ARE INEXTRICABLY TIED TOGETHER IN NATURE'S UNITY AND THAT THE WISE USE OF ONE DEPENDS ON THE WISE USE OF OTHERS. AND, FINALLY, IF THE EXPERIMENT WAS SUCCESSFUL, IT WAS TO SERVE AS A NATIONAL DEMONSTRATION FOR DEVELOPING NATURAL RESOURCES IN WAYS THAT WOULD PERMIT GROWTH WITHOUT DESTROYING THE VERY BASIS THAT NURTURES ALL LIFE.

WHILE THE EXPERIMENT HAS BEEN IMPERFECT IN SOME WAYS, THE EVIDENCE IS ON THE SIDE OF SUCCESS. A REGIONAL PERSPECTIVE, RATHER THAN A DISTANT VIEW FROM A FAR AWAY CAPITOL OR THE IMMEDIATE INTERESTS OF A COUNTY COURTHOUSE, HAS PROVEN INVALUABLE IN ADDRESSING NATURAL RESOURCE CONCERNS. AND AN INTEGRATED APPROACH THROUGH WHICH LAND, WATER AND AIR COME UNDER A COMMON BANNER HAS PROVEN EQUALLY INVALUABLE.

WHAT BEGAN AS A NATIONAL EXPERIMENT HAS, INDEED, TURNED INTO A NATIONAL DEMONSTRATION THAT CONTINUES TO HELP THIS NATION FACE MAJOR ISSUES THROUGH THE TESTING AND DISSEMINATION OF NEW TECHNOLOGIES, NEW RESEARCH APPROACHES, AND RELEVANT RESOURCE MANAGEMENT PROGRAMS. WHAT BEGAN AS A UNIQUE NATIONAL EXPERIMENT HAS MATURED INTO A TRUE NATIONAL ASSET. A BRIEF

OVERVIEW OF TVA'S RESOURCE DEVELOPMENT EFFORTS WILL HELP ESTABLISH THIS POINT.

BEFORE WE GET INTO A DESCRIPTION OF THESE EFFORTS, LET'S STEP BACK AND TAKE A LOOK AT THE LEVEL OF ANNUAL CONGRESSIONAL APPROPRIATIONS FOR TVA'S REGIONAL DEVELOPMENT PROGRAMS. EACH YEAR CONGRESS APPROPRIATES FUNDS FOR A VARIETY OF PROGRAMS THAT FALL WITHIN TVA'S MULTIPURPOSE MISSION. IN 1970, FIFTEEN YEARS AGO, TVA'S APPROPRIATION FROM CONGRESS WAS ABOUT \$50 MILLION. SINCE THEN, APPROPRIATIONS HAVE RANGED FROM A LOW OF \$46 MILLION IN 1974 TO A HIGH OF \$222 MILLION IN 1980. IN FISCAL YEAR 1984, CONGRESSIONAL APPROPRIATIONS CAME TO \$132 MILLION. WHEN INFLATION IS TAKEN INTO ACCOUNT, THE 1984 APPROPRIATION (\$132 MILLION) IS ROUGHLY EQUIVALENT TO THE 1970 APPROPRIATION (\$50 MILLION). THEREFORE, IN TERMS OF APPROPRIATIONS FROM CONGRESS, WE'RE BACK TO ABOUT WHERE WE WERE 15 YEARS AGO. CHART THREE IN THE APPENDIX HELPS MAKE THIS POINT GRAPHICALLY.

FURTHER CUTS WOULD CRITICALLY JEOPARDIZE ITS NONPOWER PROGRAMS THAT SERVE THE REGION AND THE NATION SO WELL-- PROGRAMS SUCH AS TVA'S NATIONAL FERTILIZER DEVELOPMENT CENTER.

NATIONAL FERTILIZER DEVELOPMENT CENTER

FOR SEVERAL DECADES, A BASIC CHALLENGE OF AMERICAN AGRICULTURE HAS BEEN TO GET MORE PRODUCTIVITY OUT OF A DWINDLING NUMBER OF ACRES. THE TECHNOLOGICAL AND AGRICULTURAL

RESPONSE TO THAT CHALLENGE HAS BEEN NOTHING SHORT OF ASTOUNDING. OUR FARMERS ARE FEEDING A POPULATION 75 PERCENT LARGER THAN IN THE 1930S, AND THEY ARE DOING SO ON LESS AVAILABLE CROPLAND. ALTHOUGH OUR FARMERS CONSTITUTE LESS THAN ONE TENTH OF ONE PERCENT OF THE WORLD'S POPULATION, THEY PRODUCE 25 PERCENT OF THE WORLD'S FOOD SUPPLY--BRINGING INTO THIS COUNTRY'S ECONOMY BETWEEN \$30 AND \$40 BILLION A YEAR IN EXPORT TRADE.

FARM PRODUCTIVITY HAS INCREASED, AND THE USE OF FERTILIZER ACCOUNTS FOR ABOUT 40 PERCENT OF THIS ELEVATED PRODUCTIVITY. AND A KEY TO THE DEVELOPMENT AND CONTINUAL IMPROVEMENT OF FERTILIZER HAS BEEN TVA'S OWN NATIONAL FERTILIZER DEVELOPMENT CENTER--THE NATION'S ONLY FACILITY DEALING WITH ALL PHASES OF FERTILIZER RESEARCH. HERE SUPERPHOSPHATE AND AMMONIUM NITRATE FERTILIZERS WERE DEVELOPED FOR COMMERCIAL PRODUCTION. HERE GRANULATED AND FLUID FERTILIZERS WERE INTRODUCED. HERE NEW ENERGY-SAVING MANUFACTURING PROCESSES WERE FIRST PERFECTED.

THROUGH AN EFFECTIVE TECHNOLOGY TRANSFER PROCESS AND A CLOSE-WORKING PARTNERSHIP WITH THE FERTILIZER INDUSTRY, TVA FERTILIZERS AND FERTILIZER-RELATED TECHNOLOGIES ARE NOW USED IN THE PRODUCTION OF THREE-FOURTHS OF ALL FERTILIZERS.

TVA HAS ALWAYS SHARED ITS FERTILIZER TECHNOLOGY BREAKTHROUGHS WITH OTHERS, AND THAT'S A KEY INGREDIENT TO THE

SUCCESS OF NFDC. MORE THAN 660 LICENSES HAVE BEEN ISSUED TO THE FERTILIZER INDUSTRY FOR THE NONEXCLUSIVE USE OF TVA DEVELOPMENTS. THESE LICENSES HAVE GONE TO 390 COMPANIES FOR USE IN AT LEAST 579 PLANTS IN 39 STATES. CHART FOUR IN THE APPENDIX SHOWS THE APPROXIMATE LOCATION OF THOSE PLANTS.

TVA ALSO WORKS CLOSELY WITH UNIVERSITIES AND THE FERTILIZER INDUSTRY TO INTRODUCE NEW FERTILIZER TECHNOLOGY. IN 1984 ALONE, SUCH JOINT ACTIVITIES WERE CONDUCTED IN 44 STATES AND PUERTO RICO.

THE ACCUMULATED BENEFITS TO THE NATION OF TVA'S NATIONAL FERTILIZER DEVELOPMENT CENTER (NFDC) HAVE FAR EXCEEDED THE CENTER'S TOTAL COST. FOR EXAMPLE, THE PRESENT VALUE OF BENEFITS FROM THE ADOPTION OF HIGH-ANALYSIS FERTILIZERS--PROJECTED TO 1990--IS ALMOST \$49 BILLION. AND THE CURRENT VALUE OF SAVINGS TO THIS NATION'S AGRICULTURAL INDUSTRY FROM NFDC-ORIGINATED PROCESS DEVELOPMENTS AND IMPROVEMENTS IS \$8.5 BILLION.

THE NFDC'S TOTAL PROGRAM COST FROM 1933 THROUGH 1984 WAS APPROXIMATELY \$500 MILLION DOLLARS. THIS REPRESENTS APPROXIMATELY \$20 IN BENEFITS FOR EACH DOLLAR OF PROGRAM COST--WITHOUT COUNTING OTHER NATIONAL BENEFITS WE HAVE NOT ATTEMPTED TO QUANTIFY.

AND ABOUT 80 PERCENT OF THE DEVELOPMENTAL COST OF NEW FERTILIZERS IS BORNE BY THE FERTILIZER INDUSTRY THROUGH THE PURCHASE OF EXPERIMENTAL FERTILIZERS.

SOIL EROSION

GOOD LAND STEWARDSHIP REQUIRES MORE THAN ENRICHING SOILS THROUGH CHEMISTRY. IT REQUIRES AN OVERALL REGARD FOR THE INTERACTION OF SOILS WITH OTHER ELEMENTS OF NATURE. IF SOILS ARE WASHED AWAY--REGARDLESS OF HOW FERTILE THEY ARE--THEY ARE UNAVAILABLE FOR PRODUCTIVE USE.

IN THE 1930S, 7 MILLION OF THE VALLEY'S 12 MILLION ACRES OF CLEARED LAND WERE SUFFERING FROM SERIOUS SOIL EROSION, WITH HUGE 50-FOOT GULLEYS AN ALL TOO COMMON SIGHT. A COOPERATIVE NETWORK OF DEMONSTRATION FARMS BROUGHT IMPROVED AGRICULTURAL PRACTICES TO VALLEY FARMERS AND HELPED REDUCE THE DAMAGE OF EROSION.

BUT THE CHANGING ECONOMICS OF FARMING IN THE 1970S, BROUGHT SOIL EROSION BACK TO THE VALLEY AS A SERIOUS AGRICULTURAL AND ENVIRONMENTAL PROBLEM. IN 1979, TVA AND THE U.S. DEPARTMENT OF AGRICULTURE SIGNED A COOPERATIVE AGREEMENT TO ADDRESS THE REEMERGENCE OF SOIL EROSION IN A TARGETED AREA IN THE WESTERN PORTION OF TVA'S SERVICE REGION. WITH COOPERATION FROM STATE AGENCIES AND UNIVERSITIES, THIS PROGRAM ACHIEVED DRAMATIC RESULTS. IN FOUR SHORT YEARS, THE USE OF NO-TILL FARMING PRACTICES, WHICH REDUCE SOIL EROSION SIGNIFICANTLY, INCREASED IN THE TARGETED AREA FROM 40,000 ACRES TO OVER 225,000 ACRES.

USING THESE MEASURES AND OTHERS, EROSION WAS CUT BY 74 PERCENT ON ABOUT 100 DEMONSTRATION FARMS--SAVING ALMOST 1.2 MILLION TONS OF TOPSOIL EACH YEAR ON THESE FARMS ALONE. NOT ONLY WAS THIS PROGRAM AN ENVIRONMENTAL PLUS, IT WAS AN ECONOMIC BONUS AS WELL. CROP YIELDS INCREASED, AND PRODUCTION COSTS WENT DOWN.

THE LATEST CHAPTER IN THE STRUGGLE AGAINST SOIL EROSION IS NOW BEING WRITTEN THROUGH A COOPERATIVE PROJECT AMONG TVA, STATE AGRICULTURAL AGENCIES, STATE UNIVERSITIES AND THE U.S. DEPARTMENT OF AGRICULTURE. IT'S CALLED THE "LAND AND WATER 201 PROGRAM." THE 201 REFERS TO THE NUMBER OF COUNTIES IN THE TVA REGION AND SIGNIFIES THAT THE PROGRAM'S EROSION CONTROL MEASURES WILL BE AVAILABLE TO FARMS THROUGHOUT THE VALLEY.

THE BENEFITS OF LAND AND WATER 201 HAVE ALREADY BEEN RECOGNIZED IN WASHINGTON AND FELT ON VALLEY FARMS. IT HAS BEEN CALLED A NATIONAL MODEL FOR INTERAGENCY CONSERVATION EFFORTS BY SECRETARY OF AGRICULTURE JOHN BLOCK. AND IN THE VALLEY REGION FARMERS HAVE WITNESSED ITS IMPACT ON THE GROUND WHERE SOIL LOSSES HAVE BEEN REDUCED AN AVERAGE OF 4 TONS PER YEAR, AND IN SOME INSTANCES CUT FROM 30 TONS TO 2 TONS.

MINE RECLAMATION

THE LINKAGES BETWEEN LAND AND OUR ECONOMY EXTEND BEYOND THE AVAILABILITY AND PRODUCTIVITY OF OUR TOPSOILS TO THE VITAL

RESOURCES THAT LIE BENEATH THOSE SOILS. AS AN AGENCY CONCERNED WITH THE INTERCONNECTIONS IN NATURE, TVA HAS LEARNED THE HARD LESSON THAT NEGLECTING LANDS FROM WHICH COAL IS MINED MAY PROVE A SHORT-TERM GAIN, BUT IT LEADS INEVITABLY TO A LONG-TERM ENVIRONMENTAL AND ECONOMIC LOSS.

SINCE THE MID-1960S, TVA--ONE OF THE NATION'S LARGEST CONSUMERS OF COAL--HAS TAKEN AN AFFIRMATIVE STAND ON THE RECLAMATION OF MINED LANDS. WE'VE NOT ONLY REQUIRED OUR COAL SUPPLIERS TO HEAL THE SCARS WHICH SURFACE MINING CAUSES, BUT HAVE ALSO--IN COOPERATION WITH STATE AGENCIES--RETURNED TO RECLAIM PREVIOUSLY ABANDONED MINES, WHETHER OR NOT THEY WERE MINES SUPPLYING COAL TO TVA.

BETWEEN 1976 AND 1980, OVER 17,000 ACRES OF ABANDONED COAL MINES WERE RESTORED. AND NOW TVA HAS TURNED ITS ATTENTION TO THE ABUSE OF NONCOAL MINERAL LANDS. NO BETTER EXAMPLES EXIST OF TVA'S WILLINGNESS TO CORRECT PAST MISTAKES AND EMPHASIZE TO ITS HISTORIC, ENVIRONMENTAL ROOTS.

FLOOD ZONE PLANNING

WHETHER IT'S IMPROVING THE FERTILITY OF SOILS, OR PROTECTING THEM FROM DISLOCATION, TVA'S CONCERN FOR THE WISE USE OF LAND DATES BACK TO ITS EARLIEST EFFORTS TO PREVENT FLOODING. BEFORE THE CONSTRUCTION OF TVA'S DAMS AND

RESERVOIRS, LOW-LYING LANDS ALONG THE TENNESSEE RIVER WERE SUBJECTED TO TORRENTIAL FLOODS WHICH THREATENED LIFE AND BROUGHT ECONOMIC DEVASTATION. IN TODAY'S COMFORT, WE FORGET WHAT THIS FLOODING WAS LIKE. CONSIDER FOR A MOMENT, THIS ACCOUNT OF FLOODING IN CHATTANOOGA BEFORE TVA'S DAMS WERE BUILT.

THERE WERE STEAMBOATS SAILING UP MARKET STREET IN DOWNTOWN CHATTANOOGA. . . . SOME OF THE TWO-STORY BUILDINGS WERE COMPLETELY UNDER WATER. IT WENT TO ALMOST 58 FEET. PEOPLE AND ANIMALS DIED, AND THERE WAS DISEASE BECAUSE OF THE DECAYING VEGETATION AND ANIMALS--TYPHOID AND MALARIA.

FLOODING OF THAT MAGNITUDE ALONG THE TENNESSEE RIVER AND ITS MAJOR TRIBUTARIES WAS BROUGHT UNDER CONTROL BY TVA. YET MINOR FLOODING PERSISTS TODAY, ESPECIALLY ALONG THE VALLEY'S SMALLER RIVERS AND STREAMS. IN THESE SITUATIONS, THE COSTS OF STREAM CHANNELIZATION OR DAM BUILDING USUALLY OUTWEIGH THE ECONOMIC AND ENVIRONMENTAL GAINS.

BY THE 1950S, IT BECAME APPARENT THAT STRUCTURAL FLOOD CONTROL PROJECTS ALONE--REGARDLESS OF THEIR ENORMOUS UTILITY--DID NOT PROVIDE THE FULL ANSWER FOR DEALING WITH FLOODS. THE RESULT WAS THE CREATION OF TVA'S FLOOD MANAGEMENT PROGRAM, A PROGRAM THAT HAS BEEN NATIONALLY RECOGNIZED AS A PIONEER IN FLOOD ZONE PLANNING AND HAS BEEN ADOPTED IN STATES ACROSS THE COUNTRY.

THE PRINCIPLE OF THE PROGRAM IS RELATIVELY SIMPLE; IF YOU CAN'T ALWAYS KEEP FLOODS AWAY FROM PEOPLE, KEEP PEOPLE AWAY FROM FLOODS. TVA'S FLOOD MANAGEMENT PROGRAM MAKES DETAILED FLOODING DATA AVAILABLE TO LOCAL COMMUNITIES AND ENCOURAGES THEM TO USE IT AS THEY DEVELOP LAND USE PLANS AND AS THEY ZONE FOR GROWTH. TVA DOESN'T COME IN WITH A HEAVY HAND IN THIS MATTER, BUT RATHER WITH A WEALTH OF TECHNICAL INFORMATION THAT CAN BE VITALLY IMPORTANT FOR A COMMUNITY'S WELL-BEING.

RESERVOIR WATER QUALITY

TVA'S DAMS AND RESERVOIRS ARE A CONTINUING REMINDER OF THE UNYIELDING LINK BETWEEN WATER AND LAND. IT'S ESTIMATED THAT THE NATION HAS SAVED OVER \$3 BILLION IN FLOOD DAMAGES AS A RESULT OF THESE MAGNIFICENT STRUCTURES. BUT TVA'S ONCE-YOUNG RESERVOIRS HAVE MATURED AND COSTLY WATER QUALITY PROBLEMS HAVE RESULTED.

SIGNS OF THAT MATURITY FIRST APPEARED ABOUT A DECADE AGO WHEN OUR RESEARCHERS OBSERVED REDUCTIONS IN THE WATER'S DISSOLVED OXYGEN CONTENT. AS RESERVOIRS AGE, ORGANIC MATERIALS INCREASE, ESPECIALLY AT DEEPER LEVELS, AND THE AMOUNT OF OXYGEN DECREASES. THE DEPLETION OF OXYGEN DRAINS A RESERVOIR'S VITALITY AND AFFECTS THE QUALITY OF WATER THAT FLOWS DOWNSTREAM FROM THE DAM'S TURBINES WHICH TYPICALLY DRAW WATER FROM THE RESERVOIR'S LOWER DEPTHS WHERE OXYGEN DEPLETION IS USUALLY THE GREATEST.

CONSEQUENTLY, WATER QUALITY DOWNSTREAM SUFFERS AND ITS ABILITY TO SUSTAIN AQUATIC LIFE IS DIMINISHED. THIS CONDITION IS COMPOUNDED WHEN A SERIES OF DAMS AND RESERVOIRS IS INVOLVED--AS ON THE TENNESSEE RIVER.

RECOGNIZING THIS PROBLEM, TVA BEGAN A THREE-YEAR EXPERIMENTAL PROGRAM TO IMPROVE DISSOLVED OXYGEN LEVELS DOWNSTREAM OF TVA DAMS. AS ONE EXAMPLE, EXPERIMENTAL DEVICES INSTALLED AT TVA'S NORRIS DAM HAVE SUBSTANTIALLY IMPROVED THE OXYGEN CONTENT DOWNSTREAM, ADDING AS MUCH AS A MILLION CUBIC FEET OF OXYGEN ON A HOT SUMMER DAY AND BRING DISSOLVED OXYGEN READINGS ONCE NEAR ZERO BACK TO NEAR NORMAL. THE COST OF "TURBINE AERATION," AS IT'S CALLED, IS REASONABLE AND ITS IMPACT ON HYDROGENERATION IS MINIMAL.

WITH 1,000 DAMS ACROSS THE NATION AFFECTED BY SIMILAR CONDITIONS, THIS SUCCESSFUL DEMONSTRATION WILL REACH BEYOND THE TENNESSEE VALLEY REGION TO RIVERS IN EVERY SECTION OF THE COUNTRY.

WATER BUBBLE

ANOTHER EXAMPLE OF TVA'S CAMPAIGN TO DEMONSTRATE TECHNIQUES THAT HELP KEEP THE NATION'S WATER CLEAN CAN BE FOUND ALONG THE HOLSTON RIVER IN THE NORTHEAST CORNER OF TENNESSEE. HERE TVA, IN COOPERATION WITH EPA, STATE AGENCIES, LOCAL GOVERNMENTS AND

PRIVATE FIRMS, IS HELPING CARRY OUT AN INNOVATIVE EXPERIMENT FOR DEVELOPING A COST-EFFECTIVE MEANS OF ADDRESSING WATER POLLUTION IN FLOWING STREAMS.

OVER THE PAST 10 YEARS, INDUSTRIAL FIRMS IN THIS AREA HAVE INVESTED OVER \$100 MILLION IN WASTE TREATMENT FACILITIES--AND YET PORTIONS OF THE STREAM STILL DON'T MEET EXISTING WATER QUALITY CRITERIA. THE ENVIRONMENT REMAINS THREATENED BUT SO TOO IS THE FUTURE WELL-BEING OF THE ECONOMY. IF THESE CRITERIA ARE NOT MET, INDUSTRIAL GROWTH BECOMES STYMIED.

THIS DEMONSTRATION HAS COME UP WITH SOME IMPORTANT FINDINGS OF NATIONAL INTEREST. WE HAVE DISCOVERED THAT TIMED FLOW RELEASES FROM UPSTREAM DAMS, AND INSTREAM AERATION, CAN ACHIEVE THE SAME RANGE OF DISSOLVED OXYGEN CONCENTRATION AS MORE COSTLY, TECHNOLOGY-BASED TREATMENT CONTROLS. THE PROCEDURES WE HAVE TESTED CAN ACHIEVE THE SAME ENVIRONMENTAL RESULTS AS OTHER TECHNOLOGIES, BUT CAN DO SO WITH \$30 MILLION LESS IN WASTE TREATMENT EXPENDITURES.

GROUNDWATER

AS AN INTEGRATED RESOURCE DEVELOPMENT AGENCY, TVA IS CONCERNED NOT JUST WITH THOSE WATERS THAT FLOW ABOVE THE GROUND BUT ALSO WITH THE WATERS THAT FLOW QUIETLY BELOW THE GROUND. AND THIS CONCERN IS HEIGHTENED BY ONE SIMPLE, YET IMPORTANT,

FACT; ALMOST TWO-THIRDS OF ALL RESIDENTS IN THE TENNESSEE VALLEY REGION RELY ON GROUNDWATER FOR THEIR DRINKING SUPPLY AND OTHER USES.

OUR REGION'S WATER REMAINS CLEANER THAN MOST. YET IN THE LAST FIVE YEARS, 2,400 CASES OF ACUTE GROUNDWATER-BORNE DISEASE HAVE BEEN REPORTED IN THE SEVEN VALLEY STATES. NEARLY 250 OF THESE CASES HAVE BEEN HEPATITIS, AND THERE HAS BEEN ONE FATALITY.

IN 1984, TVA SPEARHEADED AN EXTENSIVE EDUCATIONAL EFFORT IN EAST TENNESSEE TO SHOW LOCAL GOVERNMENTS WHAT ACTIONS THEY COULD TAKE TO PROTECT THEIR GROUNDWATER. WE PUT OUR CONSIDERABLE TECHNICAL EXPERTISE TO USE IN DEVELOPING AQUIFER MAPS, DESIGNING EFFECTIVE LAND USE PLANS, CREATING EDUCATIONAL PROGRAMS, AND ASSISTING LOCAL OFFICIALS IN DEVISING PLANS TO PROTECT THEIR RECHARGE AREAS. A RECENT PUBLICATION MAKES OUR FINDINGS AVAILABLE TO COMMUNITIES THROUGHOUT THE REGION AND NATION.

WHETHER ABOVE OR BELOW GROUND, WATER IS A BASIC SUSTAINING RESOURCE THAT CAN'T BE TAKEN FOR GRANTED IN THE TVA REGION OR THE NATION AS A WHOLE. BY APPLYING NEW TECHNOLOGIES AND NEW COST-EFFECTIVE STRATEGIES FOR MAINTAINING ACCEPTABLE WATER QUALITY LEVELS, AND BY DEMONSTRATING COOPERATIVE APPROACHES THAT WORK, THE TVA REGION WILL BE IN A GOOD POSITION TO SHARE SOME VALUABLE LESSONS WITH THE REST OF THE COUNTRY.

AIR QUALITY

WHAT WE HAVE LEARNED ABOUT MAINTAINING AIR QUALITY ALSO PROVIDES VALUABLE INFORMATION FOR THE NATION. BUT THE STORY BEHIND THAT LESSON GOES BACK TO TVA'S ORIGINS, AND BACK TO WATER. THE ELECTRICITY THAT FLOWED FROM TVA'S DAMS AND CROSSED THE VALLEY REGION ON A SPIDER WEB OF ELECTRICAL LINES BROUGHT LIGHT TO WHAT HAD BEEN RURAL DARKNESS AND HELPED TURN THE ENGINES OF A GROWING INDUSTRIAL BASE. BUT INEXPENSIVE HYDROELECTRICITY TURNED OUT TO WHET THE REGION'S APPETITE FOR ELECTRICITY MORE THAN SATISFY IT. AS THAT APPETITE GREW, THE NEED FOR ADDITIONAL GENERATING CAPACITY GREW--A NEED THAT WAS MET THROUGH THE CONSTRUCTION OF 11 COAL-FIRED STEAM PLANTS BETWEEN THE 1950S AND 1970S. WHILE THESE PLANTS HELPED POWER THE REGION'S ECONOMY DURING AN UNPRECEDENTED PERIOD OF GROWTH, THEY DID SO AT A PRICE TO THE REGION'S AND NATION'S ENVIRONMENT. AND TVA CAME TO BE THE NATION'S SINGLE LARGEST AIR POLLUTER.

TO TURN THAT SITUATION AROUND, TVA BEGAN INSTALLING INCREASINGLY EFFICIENT POLLUTION CONTROL EQUIPMENT ON THESE PLANTS AND ADOPTING OTHER POLLUTION CONTROL MEASURES. IN 1983, TVA COMPLETED ITS EMISSIONS CONTROL PROGRAM AND IS NOW IN FULL COMPLIANCE WITH THE FEDERAL CLEAN AIR ACT.

GOING THROUGH THIS PROCESS HAS ALSO ENCOURAGED TVA TO TAKE A POSITIVE STAND ON THE ACID RAIN CONTROVERSY. LAST YEAR, THE BOARD OF DIRECTORS ADVOCATED A POLICY OF FURTHER REDUCTION OF SULFUR AND NITROGEN OXIDES USING LEAST-COST CONTROL STRATEGIES AND HAS URGED THE PASSAGE OF NATIONAL LEGISLATION TO THIS END.

BUT TVA'S CONCERN FOR AIR QUALITY DOESN'T STOP WITH SULFUR DIOXIDE AND ACID RAIN.

YOU'VE HEARD THAT OUR ENERGY CONSERVATION PROGRAM IS GOOD ECONOMICS, WHICH IT IS. BUT IT'S ALSO GOOD FOR THE ENVIRONMENT. BY REDUCING PEAK DEMAND BY OVER 1,000 MEGAWATTS, WE'RE REDUCING OUR NEED FOR A LARGE STEAM PLANT OR NUCLEAR UNIT. AND A PLANT THAT WE DON'T HAVE TO BUILD SAVES RESOURCES THAT CAN BE PUT TO OTHER USES. AND A PLANT WE DON'T HAVE TO BUILD MEANS LESS AIR POLLUTION OR LESS RADIOACTIVE WASTES TO HANDLE.

COST-EFFECTIVE ENERGY CONSERVATION REDUCES THE RISK OF POLLUTION--THERE'S SIMPLY NO DOUBT ABOUT IT. ALL OF OUR RESOURCES--OUR LAND, WATER AND AIR--ARE IN BETTER SHAPE AS A RESULT, AND OUR ECONOMY IS HEALTHIER AT THE SAME TIME.

THERE IS ONE NEGATIVE FACTOR TO BE CONSIDERED, HOWEVER; THAT IS THE GROWING CONCERN OVER A STAGNATING INDOOR AIR QUALITY EXACERBATED BY ENERGY CONSERVATION MEASURES.

AS ADDED INSULATION REDUCES THE AIR EXCHANGE INSIDE OUR

HOMES; AS THE PUBLIC TURNS INCREASINGLY TO WOODBURNING STOVES AS AN ALTERNATIVE HEAT SOURCE; AND AS MORE LOW-INCOME FAMILIES ARE FORCED TO DECREASE THEIR LIVING SPACE DURING WINTER MONTHS TO SAVE ENERGY, WE MUST BECOME MORE KNOWLEDGABLE ABOUT INDOOR AIR QUALITY AND ITS AFFECT ON HUMAN HEALTH. WE CERTAINLY DON'T WANT TO SIMPLY SWAP ONE FORM OF AIR POLLUTION FOR ANOTHER. FOR ITS PART, TVA IS INVOLVED IN A COOPERATIVE RESEARCH PROJECT EXPLORING THE NATURE OF INDOOR AIR POLLUTION WITH THE HOPE THAT BY BUILDING A BETTER UNDERSTANDING, PATHWAYS TO SOLVING THIS PROBLEM WILL BE FOUND.

WHEIHER IT'S THE QUALITY AND USE OF OUR AIR, LAND OR WATER, TVA HAS A RESPONSIBILITY TO LOOK AFTER, AND TO THE EXTENT POSSIBLE, HELP CARE FOR THE REGION'S RESOURCES IN AN INTEGRATED WAY. IN THIS SECTION OF OUR TESTIMONY, WE HAVE PRESENTED VARIOUS TVA INITIATIVES THAT FOLLOW FROM THIS RESPONSIBILITY. SUCH INITIATIVES ON OCCASION APPEAR DIVERSE AND DIFFUSE, BUT ARE TIED TOGETHER WITH A COMMON THREAD, A THREAD THAT STRETCHES THROUGHOUT THE TENNESSEE VALLEY AUTHORITY AND HELPS TO DEFINE ITS FUNDAMENTAL CHARACTER. TVA IS NOT JUST A LAND AGENCY, A WATER AGENCY, OR AN AIR QUALITY AGENCY, BUT A REGIONAL, INTEGRATED RESOURCE DEVELOPMENT AGENCY CONCERNED WITH EACH OF THESE FUNDAMENTAL RESOURCES AS THEY EXIST IN NATURE'S UNITY AND SUSTAIN EVERYTHING THAT LIVES.

OUR CONCERN FOR THESE RESOURCES CONSTITUTES A MEANS TOWARD AN END AND THAT END, AS STATED EXPLICITLY IN THE TVA ACT, IS "TO IMPROVE THE ECONOMIC AND SOCIAL WELL-BEING OF THE PEOPLE."

IT'S THE PEOPLE WHO ARE THE ULTIMATE RECIPIENTS OF AN IMPROVED AND MORE PRODUCTIVE RESOURCE BASE. AND IT'S THE PEOPLE WHO WILL ULTIMATELY SUSTAIN OR DENY ITS BENEFITS. THAT'S WHY TVA FROM ITS INCEPTION HAS OFFERED PROGRAMS DESIGNED TO TEACH PEOPLE ABOUT THEIR ENVIRONMENT.

ENVIRONMENTAL EDUCATION

THOSE PROGRAMS BEGAN WITH TVA'S FIRST PROJECT AT NORRIS DAM. AND THEY CONTINUE TODAY AT TVA'S LAND BETWEEN THE LAKES (LBL).

LBL IS A 170,000-ACRE WILDERNESS PENINSULA IN WESTERN KENTUCKY AND TENNESSEE, SURROUNDED BY KENTUCKY LAKE ON ONE SIDE AND LAKE BARKLEY ON THE OTHER. IT'S THE SECOND LARGEST CONTIGUOUS FEDERAL LANDHOLDING EAST OF THE MISSISSIPPI.

IN 1963, PRESIDENT KENNEDY ESTABLISHED LBL AS A NATIONAL DEMONSTRATION IN OUTDOOR RECREATION, ENVIRONMENTAL EDUCATION, AND RESOURCE MANAGEMENT. HE GAVE RESPONSIBILITY FOR ITS DEVELOPMENT AND ADMINISTRATION TO TVA, CITING THE AGENCY'S HISTORIC ROLE IN RESOURCE CONSERVATION AND MANAGEMENT.

SINCE LBL'S CREATION 22 YEARS AGO, STUDENTS AND TEACHERS,

FISHERMEN AND HUNTERS, BIOLOGISTS AND FARMERS, BIRD WATCHERS AND VACATIONERS HAVE COME TO LBL TO ENJOY AND LEARN. LAST YEAR ALONE, MORE THAN TWO MILLION VISITORS, REPRESENTING ALL 50 STATES AND 20 FOREIGN NATIONS, CAME TO THIS SPOT OF SOLITUDE AND BEAUTY.

LBL SERVES AS AN AMBASSADOR FOR THE ENTIRE NATION. ITS SEMINARS, INTERNSHIPS AND CONFERENCES DRAW NATURAL RESOURCE SPECIALISTS FROM AROUND THE GLOBE. ITS SUMMER PROGRAMS AND WORKSHOPS IN ASTRONOMY AND ANTHROPOLOGY, WILDLIFE PHOTOGRAPHY AND SOLAR ENERGY, TIMBER HARVESTING AND NO-TILL FARMING, EAGLE RESTORATION AND FRONTIER LIVING ENRICH EACH VISITOR'S APPRECIATION FOR THE ENVIRONMENT--ELEVATING AN ENJOYABLE EXPERIENCE INTO AN EDUCATIONAL ONE. THEY COME AWAY WITH A KEENER AWARENESS OF THE CONNECTIONS BETWEEN THE WAY WE LIVE AND THE ENVIRONMENT WE LIVE IN.

LBL ALSO MEANS A GREAT DEAL TO THE LOCAL ECONOMY. IT'S THE CENTERPIECE OF AN ANNUAL \$150 MILLION TOURIST INDUSTRY WHICH HELPS THIS PARTICULAR PART OF THE VALLEY REGION STAND ON ITS OWN TWO FEET.

IN ADDITION TO THE LAND BETWEEN THE LAKES, THE IMPORTANT CONNECTIONS BETWEEN A REGION'S SOURCES OF ENERGY, ITS ENVIRONMENT AND ITS ECONOMY ARE BEING STRESSED THROUGH A NETWORK OF UNIVERSITY-BASED ENVIRONMENTAL AND ENERGY EDUCATION

CENTERS. WITH A SMALL AMOUNT OF SEED MONEY, 13 CENTERS HAVE BEEN ESTABLISHED. FIVE ARE NOW FINANCIALLY INDEPENDENT, OPERATING WITH MONEY FROM THEIR OWN UNIVERSITIES OR FROM OTHER SPONSORS.

THESE CENTERS PROVIDE TEACHER TRAINING, DEVELOP LEARNING MATERIALS FOR ELEMENTARY AND SECONDARY SCHOOLS, OFFER SPECIALIZED PROGRAMS FOR CITIZEN GROUPS, AND ENCOURAGE RESEARCH INTO ENVIRONMENTAL EDUCATION EFFORTS.

IN THESE EFFORTS, SUCCESS CAN BE MEASURED TO SOME EXTENT THROUGH EMULATION. UNIVERSITY-BASED CENTERS, MODELED AFTER THE TVA EXPERIENCE, HAVE BEEN DEVELOPED IN CALIFORNIA, WISCONSIN, AND OKLAHOMA. HERE AGAIN, TVA DEMONSTRATIONS HAVE SERVED AS A MODEL FOR OTHERS.

OUR ROLE AS A NATIONAL DEMONSTRATION IS VITALLY IMPORTANT TO US, AND WE BELIEVE TO THE NATION. WHAT OTHERS CAN LEARN FROM OUR EXPERIENCES, BOTH FROM OUR SUCCESSES AND FROM OUR BLUNDERS, IS ONE OF OUR PRINCIPAL BENEFITS AND MOST LASTING LEGACIES. AS MENTIONED, TVA WAS ESTABLISHED AS AN EXPERIMENT. AS ANY EXPERIMENT, IT IS MEANT TO BE LEARNED FROM, TO BE A SOURCE OF TESTING AND DISSEMINATION. AND WE HOPE THIS TESTIMONY HELPS CLARIFY HOW TVA CARRIES OUT THAT ROLE, NOT ONLY AS A POWER SYSTEM, BUT THROUGH ITS RESOURCE DEVELOPMENT PROGRAMS.

IN PARTICULAR, WE HOPE THIS SECTION HAS PROVIDED A MORE COMPLETE UNDERSTANDING OF THE PRINCIPLES BEHIND TVA'S NATURAL RESOURCE INITIATIVES. THESE PRINCIPLES ARE THE BEDROCK, THE FOUNDATION, FOR WHATEVER WE DO. PARTICULAR ACTIVITIES WILL CHANGE WITH TIME, AS THEY SHOULD, BUT THE PRINCIPLE OF INTEGRATED, REGIONAL RESOURCE DEVELOPMENT WILL ENDURE. ADHERENCE TO THOSE PRINCIPLES WILL BE THE TRUE HISTORIC TEST OF THE TENNESSEE VALLEY AUTHORITY.

IV: COMMUNITY AND ECONOMIC DEVELOPMENT

JUST AS TVA'S EFFORTS TO HELP DEVELOP THE REGION'S NATURAL RESOURCES ARE GUIDED BY A CENTRAL PROPOSITION, TVA'S ECONOMIC AND COMMUNITY DEVELOPMENT PROGRAMS ARE ALSO GUIDED BY A SET OF PRINCIPLES BASED ON A PARTICULAR CONCEPTION OF WHAT A FEDERALLY-SUPPORTED REGIONAL DEVELOPMENT AGENCY SHOULD DO. OUR VIEW IS THAT SUCH AN AGENCY SHOULD BUILD LOCAL INITIATIVE AND HELP COMMUNITIES STAND ON THEIR OWN TWO FEET, THAT LIMITED FEDERAL FUNDS SHOULD BE LEVERAGED THROUGH COOPERATIVE PROJECTS TO ATTRACT PRIVATE AND PUBLIC CONTRIBUTIONS, THAT SUCH COOPERATIVE PROJECTS SHOULD ADDRESS PRACTICAL, DOWN-TO-EARTH

PROBLEMS OF LOCAL COMMUNITIES, AND THAT COMMUNITY AND ECONOMIC DEVELOPMENT SHOULD TAKE INTO FULL ACCOUNT THE CONTINUAL INTERPLAY BETWEEN HUMANS AND THEIR ENVIRONMENT.

THOSE ARE THE SAME PRINCIPLES THAT HAVE GUIDED TVA'S COMMUNITY AND ECONOMIC DEVELOPMENT PROGRAMS FOR THE PAST FIVE DECADES. AND, LIKE OTHER ASPECTS OF TVA, OUR PROGRAMS IN THIS AREA ARE DESIGNED TO DO MORE THAN SERVE THIS REGION, THEY ARE ALSO DESIGNED TO SERVE THE NATION. FOR EXAMPLE:

- O THE "TUPELO MODEL" FOR VOCATIONAL TRAINING AND CAREER DEVELOPMENT, WHICH TVA HELPED DEVELOP, HAS RECEIVED NATIONAL RECOGNITION FOR ITS ADVANCED APPROACH TO VOCATIONAL TRAINING AND IS BEING REPLICATED OUTSIDE THE VALLEY REGION.
- O TVA'S TECHNICAL ASSISTANCE PROGRAM TO HELP SMALL- AND MEDIUM-SIZED MANUFACTURING FIRMS OVERCOME THE HURDLES OF EXPANSION IS NOT ONLY CREATING JOBS FOR THE REGION, IT IS BEING ADOPTED AS A MODEL FOR TECHNICAL ASSISTANCE IN OTHER STATES AND REGIONS.
- O TVA'S COMPUTER SOFTWARE PACKAGE FOR FORESTRY MANAGEMENT IS HELPING PUT OUR FOREST RESOURCES TO BETTER USE AND HAS BEEN ADOPTED BY 225 USERS ACROSS THE COUNTRY AND THROUGHOUT THE WORLD.

THESE SPECIFIC EXAMPLES WILL BE DISCUSSED MORE FULLY LATER, BUT A BASIC POINT ABOUT TVA'S COMMITMENT TO COMMUNITY AND ECONOMIC DEVELOPMENT NEEDS TO BE MADE FIRST.

THERE ARE FEW, IF ANY, OTHER FEDERAL AGENCIES THAT HAVE AN EXPLICIT RESPONSIBILITY FOR REGIONAL ECONOMIC DEVELOPMENT THAT ALSO HAVE A DIRECT INVOLVEMENT IN THE CREATION AND MANAGEMENT OF A REGION'S BASIC ENERGY AND NATURAL RESOURCE INFRASTRUCTURE. TVA IS UNIQUE IN ITS ABILITY TO GUIDE AND APPLY THE BENEFITS OF THIS INFRASTRUCTURE TO THE REGION'S SUSTAINED, BALANCED GROWTH. TVA'S POWER SYSTEM AND NATURAL RESOURCE DEVELOPMENT EFFORTS ARE PURPOSEFULLY MANAGED TO HELP THE REGION AND ITS COMMUNITIES PROSPER. WHILE TVA'S CONGRESSIONALLY-FUNDED PROGRAMS THAT ARE SPECIFICALLY AIMED AT COMMUNITY AND ECONOMIC DEVELOPMENT ARE VITAL LINKS IN THE CHAIN, TVA'S OVERALL EFFORT TO BRING ABOUT PROGRESS IN THE REGION GOES FAR BEYOND THESE SPECIFIC INITIATIVES. AND THAT IS WHAT GIVES THE TENNESSEE VALLEY AUTHORITY AN EDGE WHEN IT COMES TO MAKING ECONOMIC DEVELOPMENT HAPPEN.

IN VIEWING TVA'S PROGRAMS THAT FOCUS SPECIFICALLY ON COMMUNITY AND ECONOMIC DEVELOPMENT, THE THEMES OF SELF-RELIANCE, COOPERATION, INTERDEPENDENCY AND PRACTICALITY ARE USEFUL GUIDES.

SELF-RELIANCE

TVA LENDS A HAND, NOT A HANDOUT. SOMETIMES, A SMALL AMOUNT OF "SEED MONEY" IS NEEDED TO PRIME THE ECONOMIC PUMP, BUT THAT MONEY IS TYPICALLY LEVERAGED WITH LOCAL AND STATE CONTRIBUTIONS. THIS REFLECTS TVA'S BASIC BELIEF THAT COMMUNITY AND ECONOMIC DEVELOPMENT, IN MOST INSTANCES, SHOULD GROW FROM AND ENCOURAGE COMMUNITY SELF-SUFFICIENCY AND NOT SIMPLY CREATE A DEPENDENCY ON OUTSIDE FUNDS. WE CAN ILLUSTRATE THIS PRINCIPLE AT WORK.

FOR HUNDREDS OF TOWNS THAT DOT THE VALLEY'S LANDSCAPE, PLANNING ASSISTANCE IS AVAILABLE THROUGH TVA'S TOWNLIFT PROGRAM. WORKING WITH LOCAL CHAMBERS OF COMMERCE AND OTHER DEVELOPMENT GROUPS, THIS PROGRAM HELPS LOCAL COMMUNITIES DEVISE SOUND STRATEGIES TO INCREASE THEIR TAX BASE, IMPROVE LOCAL MARKETS, AND CREATE NEW JOBS.

IN FISCAL '84, TOWNLIFT PLANNING AND DEVELOPMENT ASSISTANCE WAS PROVIDED TO 68 COMMUNITIES. LARGELY AS A RESULT, MORE THAN \$25 MILLION IN PRIVATE AND PUBLIC FUNDS WAS LEVERAGED TO IMPLEMENT DOWNTOWN RESTORATION AND BUSINESS DISTRICT REDEVELOPMENT PROJECTS.

RIGHT NOW, FOR EVERY DOLLAR INVESTED BY TVA IN TOWNLIFT PROJECTS, MORE THAN \$30 IS ATTRACTED FROM OTHER PRIVATE AND PUBLIC INVESTORS. THE SUCCESS OF TOWNLIFT IN CREATING JOBS AND

UPGRADING THE APPEARANCE AND FUNCTIONING OF DOWNTOWN AREAS HAS LED TO ITS USE AS A MODEL FOR A NATIONAL PROGRAM SPONSORED BY THE NATIONAL TRUST FOR HISTORIC PRESERVATION. THAT PROGRAM IS CALLED "MAIN STREET USA."

COOPERATION

IN ORDER TO BUILD SELF-RELIANCE, YOU HAVE TO RESPECT LOCAL VALUES AND BE SENSITIVE TO LOCAL NEEDS. TVA'S COMMUNITY AND ECONOMIC DEVELOPMENT PROGRAMS DON'T ADOPT A HEAVY-HANDED APPROACH OF GOVERNMENTAL INTERVENTION. RATHER, WE EMPHASIZE THE NEED FOR COOPERATION AND LOCAL INVOLVEMENT.

THAT PRINCIPLE IS ILLUSTRATED BY OUR COOPERATIVE EFFORTS WITH LOCAL COMMUNITIES IN HELPING THEM BRING NEEDED SKILLS TO THEIR RESIDENTS.

FOR INSTANCE, IN TUPELO, MISSISSIPPI, TVA--IN COOPERATION WITH THE LOCAL EDUCATORS AND COMMUNITY LEADERS--HELPED DESIGN A SYSTEM FOR BRIDGING THE GAP BETWEEN THE SKILLS NEEDED BY THE COMMUNITY AND THOSE BEING TAUGHT IN SCHOOL. A "NEEDS ASSESSMENT" WAS CONDUCTED TO DETERMINE THE VOCATIONAL SKILLS NEEDED TO KEEP LOCAL BUSINESSES VITAL, AND THEN A DETAILED PLAN AND COORDINATED VOCATIONAL CURRICULUM WAS DEVISED TO MEET THOSE NEEDS.

TO DATE, THE SUCCESS OF THE TUPELO MODEL FOR TECHNICAL

CAREER DEVELOPMENT HAS ATTRACTED THE ATTENTION OF EDUCATORS AND BUSINESS LEADERS FROM FIVE STATES OUTSIDE OF THE TENNESSEE VALLEY AND FROM SEVERAL FOREIGN COUNTRIES.

ANOTHER GOOD EXAMPLE OF THIS PRINCIPLE IS TVA'S PARTICIPATION IN A HIGH-TECH TRAINING PROGRAM AT CHATTANOOGA STATE TECHNICAL COLLEGE. AS ONE OF MANY COOPERATING PARTIES, TVA PROVIDED APPROXIMATELY \$300,000 IN SEED MONEY FOR AN INNOVATIVE, AUTOMATED MANUFACTURING TRAINING FACILITY THAT HAS ATTRACTED NEARLY \$3 MILLION FROM PUBLIC AND PRIVATE INVESTORS.

THE PROGRAM HAS ALSO ATTRACTED THE ATTENTION OF OFFICIALS FROM COLLEGES IN 20 STATES OUTSIDE THE TENNESSEE VALLEY REGION WHO ARE EXPLORING THE POSSIBILITY OF ESTABLISHING SIMILAR PROGRAMS IN THEIR AREAS.

INTERDEPENDENCY

IN ADDITION TO SELF-RELIANCE AND COOPERATION, ANOTHER IMPORTANT PRINCIPLE FOR TVA'S INITIATIVES IN COMMUNITY AND ECONOMIC DEVELOPMENT IS A RECOGNITION OF THE INTERDEPENDENCY BETWEEN ECONOMIC ACTIVITY AND ENVIRONMENTAL QUALITY. JUST AS NO REGION CAN BE EXPECTED TO PROSPER BEYOND THE ABILITIES OF ITS PEOPLE, NEITHER CAN IT BE EXPECTED TO PROSPER IF ITS RESOURCES HAVE REACHED THEIR LIMITS OF ABUSE.

THE TENNESSEE VALLEY AUTHORITY IS VITALLY CONCERNED ABOUT THESE LIMITS AND THEIR EFFECTS ON ECONOMIC GROWTH. FOR

INSTANCE, IN CLEANING UP ITS OWN AIR POLLUTION, TVA MADE IT POSSIBLE FOR OTHER INDUSTRIAL CONCERNS TO EXPAND OR LOCATE IN THE VALLEY REGION WITHOUT EXCEEDING EXISTING AIR QUALITY STANDARDS. BY COOPERATING WITH OTHERS ALONG THE HOLSTON RIVER IN SEEKING A COST-EFFECTIVE SOLUTION TO WATER QUALITY PROBLEMS, TVA IS HELPING TO PAVE THE WAY FOR FURTHER RESIDENTIAL AND ECONOMIC DEVELOPMENT ALONG THAT RIVER. AND THE PRODUCTIVE LIMITS OF THIS REGION'S LANDS WOULD HAVE CERTAINLY BEEN REACHED BY NOW WITHOUT TVA'S FERTILIZER AND SOIL EROSION PROGRAMS.

THESE LIMITS TO GROWTH ARE REAL AND CONSTRAINING. ONE OF TVA'S CHIEF ASSETS IS ITS ABILITY TO ADDRESS THESE LIMITS DIRECTLY, PARTICULARLY IN AN INTEGRATED FASHION.

PRACTICALITY

WHEN IT GETS DOWN TO THE REAL WORLD, THE PRINCIPLES OF SELF-RELIANCE, COOPERATION, AND INTERDEPENDENCY ARE IMPORTANT, BUT NO MORE SO THAN THE IMPORTANCE OF PRACTICALITY. AND THERE'S NO MORE PRACTICAL PROBLEM IN ANY REGION THAN HOW TO SUSTAIN AND CREATE JOBS.

IN COOPERATION WITH 160 ELECTRIC POWER DISTRIBUTORS ACROSS THE 7-STATE VALLEY REGION, TVA IS SHOWING HOW THIS PRACTICAL PROBLEM CAN BE SOLVED BY ASSISTING SMALL- AND MEDIUM-SIZED MANUFACTURING FIRMS MEET THE CHALLENGES OF EXPANSION.

DISTRIBUTORS OF TVA POWER HELP IDENTIFY COMPANIES WITH THE POTENTIAL FOR EXPANSION AND HELP COORDINATE TECHNICAL ASSISTANCE PROVIDED BY TVA. ASSISTANCE IS AVAILABLE IN ACHIEVING ENERGY EFFICIENCIES, IN PLANNING EXPANSIONS THAT ARE IN COMPLIANCE WITH ENVIRONMENTAL REGULATIONS, IN EMPLOYEE TRAINING, AND IN OTHER AREAS THAT HELP THESE FIRMS EXPAND EFFICIENTLY.

TO DATE, THIS PROGRAM HAS ASSISTED MORE THAN 300 COMPANIES, ALLOWING THEM TO EXPAND AND CREATE MORE THAN 10,000 NEW JOB OPPORTUNITIES FOR VALLEY WORKERS. FOR EVERY DOLLAR INVESTED IN THE PROGRAM, \$20 IS SAVED IN STATE AND LOCAL UNEMPLOYMENT AND PUBLIC ASSISTANCE PAYMENTS.

THE DEPARTMENT OF ENERGY OF OREGON, THE STATE OF NORTH CAROLINA, AND THE NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION HAVE HELD PRELIMINARY MEETINGS WITH REPRESENTATIVES FROM OUR EXISTING INDUSTRIES PROGRAM TO EXPLORE THE POSSIBILITY OF SETTING UP SIMILAR PROGRAMS IN OREGON, MINNESOTA, NORTH CAROLINA, AND OTHER AREAS OUTSIDE THE VALLEY.

ADDITIONALLY, THE SUCCESS OF OUR EXISTING INDUSTRIES PROGRAM HAS BEEN CITED IN PUBLICATIONS SPONSORED BY THE NATIONAL COUNCIL FOR URBAN DEVELOPMENT, AND THE NATIONAL ASSOCIATION OF TOWNS AND TOWNSHIPS.

THE PROGRAMS JUST MENTIONED AREN'T MEANT TO PROVIDE A COMPLETE CATALOG OF TVA'S ECONOMIC AND COMMUNITY DEVELOPMENT

EFFORTS, BUT WE DO HOPE THEY PROVIDE A SENSE OF THE GENERAL PRINCIPLES THAT GUIDE OUR EFFORTS IN THIS AREA. THESE PRINCIPLES ARE NOT STATIC CATEGORIES, INTO WHICH WE TRY TO FORCE-FIT SPECIFIC PROGRAMS. RATHER SOME OF OUR BEST PROGRAMS--LIKE THE ONE JUST DESCRIBED FOR EXPANDING INDUSTRIES--CROSS ALL BOUNDARIES. ONE PARTICULAR BOUNDARY-CROSSING EFFORT BRINGS US BACK TO ONE OF OUR ORIGINAL PROPOSITIONS; THAT TVA PROMOTES ECONOMIC GROWTH THROUGH THE WISE USE AND DEVELOPMENT OF THE REGION'S NATURAL RESOURCES.

FORESTRY INITIATIVES

FORESTS COVER NEARLY 60 PERCENT OF THE VALLEY, AND THEY OFFER A TREMENDOUS POTENTIAL FOR HELPING MEET AMERICA'S FUTURE NEED FOR TIMBER, FIBER, AND FUEL. ANNUAL GROWTH OF THE VALLEY'S PREDOMINANTLY HARDWOOD FORESTS HAS DOUBLED SINCE THE 1930S, BUT IT STILL NEEDS TO INCREASE BY 40 PERCENT TO REACH ITS FULL POTENTIAL.

IN ORDER TO HELP THE REGION'S FORESTS REACH THAT POTENTIAL, TVA IS WORKING WITH OTHERS TO BRING BETTER MANAGEMENT PRACTICES TO THE FOREST INDUSTRY AND HELP THAT INDUSTRY TAKE ADVANTAGE OF POTENTIAL MARKETS AROUND THE WORLD.

IN THE 1970S AND EARLY 1980S, TVA ESTABLISHED ITS HIGHLY SUCCESSFUL WOODPLAN PROJECT, WHICH PIONEERED NATIONALLY THE

DEVELOPMENT OF A MICROCOMPUTER SOFTWARE PACKAGE CALLED WOODPLAN FOR USE IN FOREST MANAGEMENT APPLICATIONS.

TWO YEARS AGO, AND WITH THE HELP OF TVA, THE FOREST RESOURCES SYSTEMS INSTITUTE WAS CREATED AS A MEMBERSHIP COOPERATIVE TO SERVE THE USERS OF WOODPLAN. WITHIN THOSE TWO YEARS, MEMBERSHIP HAS GROWN TO OVER 225 ORGANIZATIONS AND INDIVIDUALS FROM THROUGHOUT THE COUNTRY AND THE WORLD.

THIS SUCCESS STORY IS REPRESENTATIVE OF HOW TVA TAKES THE EARLY RISKS IN DEVELOPING TECHNOLOGY AND PRODUCT DEMAND AND SPINS OFF A PRIVATE SECTOR ORGANIZATION TO CARRY OUT THE TECHNOLOGY TRANSFER AND SUPPORT SERVICES.

TVA HAS ALSO BEEN WORKING WITH STATE AND PRIVATE GROUPS TO IDENTIFY AREAS AND SITES WHERE OPPORTUNITIES FOR FOREST INDUSTRIES CAN BE MAXIMIZED AT MINIMUM RISKS. TVA'S FOREST INVENTORY SYSTEM HAS BEEN INSTRUMENTAL IN PROVIDING TIMELY INFORMATION IN SIGNIFICANT DETAIL TO STATE DEVELOPMENT AND PROSPECTIVE WOOD PRODUCT PLANTS.

THROUGH A VARIETY OF TECHNICAL ASSISTANCE EFFORTS, TVA PROVIDES DATA ON TIMBER SPECIES, SIZE, VOLUME, AND QUALITY, AS WELL AS DATA REGARDING THE POWER, TRANSPORTATION, AND MANPOWER RESOURCES AVAILABLE IN SPECIFIC AREAS TO THE FORESTRY INDUSTRY. IN FISCAL '84, TVA RECEIVED 108 REQUESTS FOR TECHNICAL ASSISTANCE FOR ECONOMIC ANALYSES, BRANCH PLANT LOCATION STUDIES, SAWMILL ENERGY REDUCTION STUDIES, AND TIMBER PRODUCT IMPROVEMENT EFFORTS.

IN 1984, JOINT EFFORTS BETWEEN TVA AND COOPERATING ORGANIZATIONS RESULTED IN THE ANNOUNCEMENT OF PLANS FOR TWO STRUCTURAL BOARD PLANTS IN SOUTHWEST VIRGINIA AND 16 OTHER PLANT SITINGS OR EXPANSIONS REPRESENTING \$32 MILLION IN INVESTMENT, 920 NEW JOBS, AND THE ANNUAL USE OF 12 MILLION CUBIC FEET OF VALLEY-HARDWOODS.

TVA IS KEENLY AWARE OF THE UNTAPPED POTENTIAL OF EUROPEAN MARKETS FOR WOOD PRODUCTS FROM THE REGION--ESPECIALLY ALONG THE CORRIDOR OF THE TENNESSEE-TOMBIGBEE WATERWAY. RIGHT NOW, TVA IS INVOLVED IN A DEMONSTRATION PROJECT AIMED AT ENCOURAGING ECONOMIC GROWTH ALONG THE TOMBIGBEE BY USING THE WATERWAY TO EXPAND MARKETS FOR WOOD PRODUCTS PRODUCED IN THE AREA. TVA IS ALSO HELPING TO ESTABLISH MARKETING COOPERATIVES OF SMALL- AND MEDIUM-SIZED PRODUCERS TO MEET THE VOLUME OF PRODUCTS REQUIRED FOR EXPORT SALES.

THROUGH THESE VARIOUS FORESTRY-RELATED EFFORTS, TVA IS TRYING TO HELP OTHERS MEET CHALLENGES, EXPAND IN RESPONSIBLE WAYS, AND PUT THE REGION'S ABUNDANT FORESTS TO WISE USE. AND PERMEATING THIS RANGE OF FORESTRY INITIATIVES ARE THE THEMES OF SELF-RELIANCE, COOPERATION, INTERDEPENDENCY, AND PRACTICALITY.

WHETHER IT'S WORKING WITH OTHERS TO TAKE ADVANTAGE OF ECONOMIC OPPORTUNITIES OR MANAGING ITS OWN RESOURCES FOR THE

ECONOMIC BENEFIT OF THE REGION, THE TENNESSEE VALLEY AUTHORITY SEES ONE OF ITS MAIN MISSIONS AS CARRYING OUT PROGRAMS THAT RESULT IN THE SOCIAL AND ECONOMIC WELL-BEING OF THE REGION. OVER THE PAST 50 YEARS, THE PEOPLE OF THE VALLEY HAVE GROWN TO EXPECT THAT OF TVA. THEY HAVE ALSO GROWN TO EXPECT HELP, NOT A HANDOUT. AND THAT'S AS IT SHOULD BE.

BEFORE CONCLUDING OUR DISCUSSION OF TVA'S COMMUNITY AND ECONOMIC DEVELOPMENT PROGRAMS, WE FEEL COMPELLED TO SET THE RECORD STRAIGHT ON TWO POINTS OF MISUNDERSTANDING. ONE PERTAINS DIRECTLY TO OUR COMMUNITY AND ECONOMIC DEVELOPMENT EFFORTS AND THE OTHER TOUCHES ON A RELATED MATTER.

SOME PEOPLE HAVE ARGUED THAT THE FEDERAL INVESTMENT IN TVA'S COMMUNITY AND ECONOMIC DEVELOPMENT ACTIVITIES IS LARGE ENOUGH TO CONSTITUTE AN "UNFAIR" REGIONAL ADVANTAGE. AND SOME PEOPLE HAVE ARGUED THAT THE INVESTMENT IN TVA'S SYSTEM OF DAMS AND RESERVOIRS HAS NOT PAID OFF, EITHER FOR THE REGION OR FOR THE NATION. BOTH ARGUMENTS ARE ILL-FOUNDED AND BOTH NEED TO BE CORRECTED.

FAIRNESS

ON THE ISSUE OF FAIRNESS: THE VALLEY REGION IS NOT RECEIVING A DISPROPORTIONATE AMOUNT OF FEDERAL AID THROUGH THE COMMUNITY AND ECONOMIC DEVELOPMENT PROGRAMS OF TVA, OR EVEN THE EXPENDITURES OF TVA AS A WHOLE.

ON A PER CAPITA BASIS, FEDERAL EXPENDITURES IN FISCAL YEAR 1984 AVERAGED \$3,022. ACCORDING TO THE BUREAU OF CENSUS, THE FOUR PRINCIPAL VALLEY STATES--ALABAMA, KENTUCKY, MISSISSIPPI AND TENNESSEE--RECEIVED ON AVERAGE \$2,841, OR 6 PERCENT LESS THAN THE NATIONAL AVERAGE.

HOWEVER, THIS AVERAGE INCLUDED TVA'S TOTAL EXPENDITURES--ABOUT 96 PERCENT OF WHICH ARE RELATED TO THE POWER PROGRAM AND FINANCED COMPLETELY BY THE RATEPAYERS IN THE TENNESSEE VALLEY REGION, NOT THE NATION'S TAXPAYERS. IF TVA'S OWN EXPENDITURES ARE NETTED OUT, PER CAPITA FEDERAL SPENDING WOULD AVERAGE \$2,708 IN THE FOUR STATES, SLIGHTLY MORE THAN 10 PERCENT BELOW THE NATIONAL AVERAGE.

CLEARLY, THE FOUR PRINCIPAL VALLEY STATES ARE GAINING NO REGIONAL ADVANTAGE THROUGH FEDERAL EXPENDITURES.

TVA'S FEDERALLY APPROPRIATED BUDGET EXPRESSED PER VALLEY RESIDENT AMOUNTED TO ABOUT \$21 IN 1984. MUCH OF THIS, HOWEVER, IS ACCOUNTED FOR BY PROGRAMS THAT ARE CLEARLY NATIONAL, NOT REGIONAL, IN SCOPE, SUCH AS THE NATIONAL FERTILIZER DEVELOPMENT CENTER. ALSO INCLUDED IN THIS FIGURE ARE TVA PROGRAMS WHICH PROVIDE SERVICES SIMILAR TO THOSE PROVIDED TO OTHER REGIONS BY OTHER FEDERAL AGENCIES, SUCH AS THE BUREAU OF RECLAMATION OR THE U.S. ARMY CORPS OF ENGINEERS. THEREFORE, THESE PARTICULAR PROGRAMS DON'T CONTRIBUTE TO ANY SORT OF "REGIONAL" ADVANTAGE.

IF NATIONALLY TARGETED PROGRAMS AND PROGRAMS WHOSE SERVICES ARE ANALOGOUS TO THOSE PROVIDED IN OTHER REGIONS BY OTHER AGENCIES ARE NETTED OUT, THE RESIDUAL COMES TO ABOUT \$6 PER VALLEY RESIDENT. THIS AMOUNT IS NOT ENOUGH TO WARRANT A CLAIM THAT THE TVA REGION IS GAINING AN EDGE DUE TO FEDERAL APPROPRIATIONS COMING THROUGH TVA.

TO TAKE IT BACK TO A NATIONAL LEVEL; IF THIS \$6 IS ADDED TO THE AVERAGE PER CAPITA FEDERAL SPENDING OF \$2,708 FOR THE FOUR PRINCIPAL VALLEY STATES, AN ADJUSTED FIGURE OF \$2,714 IS OBTAINED. THIS ADJUSTED FIGURE IS STILL ALMOST 10 PERCENT BELOW THE NATIONAL AVERAGE. THUS, TVA CLEARLY DOES NOT DISTORT OR REALLY EVEN INFLUENCE IN A DISCERNABLE WAY THE FLOW OF FEDERAL BUDGET FUNDS AMONG THE STATES. THESE FIGURES ARE SHOWN GRAPHICALLY ON CHART FIVE IN THE APPENDIX.

EVEN WITH FEDERAL APPROPRIATIONS COMING THROUGH TVA, VALLEY STATES LAG BEHIND THE NATIONAL AVERAGE IN FEDERAL EXPENDITURES, WHEN IT COULD BE ASSUMED THAT THESE STATES SHOULD BE GETTING MORE THAN AVERAGE DUE TO THEIR RELATIVELY HIGH CONCENTRATIONS OF LOW INCOME AND UNEMPLOYED FAMILIES.

RETURN ON INVESTMENT

ON THE ISSUE OF RETURN ON INVESTMENTS: IT IS IMPORTANT TO RECOGNIZE THAT AMERICAN TAXPAYERS AND TVA RATEPAYERS HAVE A

CONSIDERABLE INVESTMENT IN TVA'S MULTIPURPOSE SYSTEM OF DAMS AND RESERVOIRS. THE NET INVESTMENT IN CURRENT YEAR PRICES IS ABOUT \$1.1 BILLION AND THE QUESTION OF AN APPROPRIATE RETURN ON THAT INVESTMENT HAS BEEN RAISED.

THE RETURN ON THAT INVESTMENT HAS TO BE CALCULATED IN TERMS OF THE TOTAL BENEFITS ACCRUED THROUGH FLOOD CONTROL, NAVIGATION, HYDROELECTRICITY AND RECREATION. THAT CALCULATION REVEALS A RETURN OF ALMOST EIGHT PERCENT IN INFLATION ADJUSTED DOLLARS. RETURNS FROM OTHER INVESTMENTS WHICH ARE APPROPRIATE FOR COMPARISON ARE SHOWN ON CHART SIX IN THE APPENDIX.

AS YOU CAN SEE, THE RETURN ON THE INVESTMENT IN TVA'S DAMS AND RESERVOIRS IS ALMOST TWICE THE AVERAGE INFLATION ADJUSTED RETURN ON COMMON STOCKS (1926-1978), AND MORE THAN SEVEN TIMES THE AVERAGE RETURN ON LONG-TERM CORPORATE BONDS (1934-1983) AND UNITED STATES TREASURY BONDS (1945-1983). IT IS ALSO IMPORTANT TO NOTE THAT THE RETURN ON TVA'S RESERVOIR SYSTEM IS ABOUT THREE TIMES GREATER THAN THE RATE OF RETURN THE CONGRESS HAS SPECIFIED TO BE USED IN PLANNING FEDERALLY FINANCED WATER PROJECTS, OR THAT GOOD PLANNING PRACTICE WOULD HAVE DICTATED.

THE ECONOMIC IMPACT OF TVA'S DAMS AND RESERVOIRS CAN ALSO BE DESCRIBED IN CONCRETE WAYS. THIRTY-SEVEN DAMS AND 14 MAIN AND AUXILIARY LOCKS ON THE TENNESSEE RIVER AND TRIBUTARIES CREATE 650 MILES OF NAVIGABLE WATERWAY AND 11,000 MILES OF

SHORELINE ON OUR SYSTEM OF RESERVOIRS. THE WATERWAY SYSTEM IS PRODUCING MORE THAN 17 BILLION KILOWATTHOURS OF ELECTRICITY EACH YEAR, AND IS SAVING SHIPPERS APPROXIMATELY \$160 MILLION PER YEAR IN FREIGHT COSTS. AND OVER THE YEARS, IT HAS PREVENTED ALMOST \$3 BILLION IN FLOOD DAMAGE.

IN ADDITION, SINCE 1945, PRIVATE INDUSTRY HAS INVESTED MORE THAN \$4.5 BILLION IN WATERFRONT FACILITIES. AND THESE FACILITIES HAVE EMPLOYED AS MANY AS 45,000 PEOPLE. THAT'S THE KIND OF ECONOMIC RETURN ALMOST ANYONE CAN UNDERSTAND.

THROUGH THE OPERATION OF OUR POWER SYSTEM, OUR WATERWAY SYSTEM, OUR NATURAL RESOURCE DEVELOPMENT PROGRAMS AND OUR COMMUNITY AND ECONOMIC DEVELOPMENT ACTIVITIES, WE ARE DOING WHAT WE CAN TO HELP THE TENNESSEE VALLEY REGION AND NATION, AND WE DON'T SHY AWAY FROM SAYING SO. BUT WE WANT TO MAKE IT CLEAR THAT WE'RE DOING SO MAINLY WITH OUR OWN RESOURCES. THE FEDERAL INVESTMENT IN TVA'S REGIONAL DEVELOPMENT PROGRAMS, ALTHOUGH CRUCIAL, DOES NOT REPRESENT AN "UNFAIR" INVESTMENT IN THE REGION AND THAT INVESTMENT BY ITSELF CERTAINLY DOES NOT GIVE THE VALLEY REGION A FEDERALLY SPONSORED ADVANTAGE OVER ANY OTHER REGION.

IF THE VALLEY DOES HAVE AN ADVANTAGE, THAT ADVANTAGE COMES FROM ITS RESOURCES AND ITS PEOPLE WHICH ARE ITS TRUE BUILDING BLOCKS FOR GROWTH AND PROGRESS.

V. GENERAL CONCLUSION

IN CONCLUSION, WE WOULD LIKE TO MAKE FOUR BASIC POINTS ABOUT THE TENNESSEE VALLEY AUTHORITY.

- O TVA'S SELF-FINANCING POWER SYSTEM NOT ONLY GENERATES THE ELECTRICITY THE REGION NEEDS, BUT DOES SO IN A WAY THAT PROTECTS THE ENVIRONMENT OF THE VALLEY AND THE NATION AND DOES SO IN WAYS THAT TEST AND DEMONSTRATE WAYS IN WHICH UTILITIES CAN ADVANCE THE PUBLIC INTEREST.

- O TVA'S FERTILIZER AND SOIL EROSION CONTROL EFFORTS ARE HELPING AMERICAN AGRICULTURE REACH UNPRECEDENTED LEVELS OF PRODUCTIVITY, CONTRIBUTING TO THE WORLD'S FOODBASKET, AND DEMONSTRATING HOW OUR FOOD SUPPLY CAN BE RENEWED FOR SUBSEQUENT GENERATIONS. THE FEDERAL INVESTMENT IN THESE PROGRAMS IS PAYING OFF FOR ALL AMERICANS IN AN AMPLE AND REASONABLY PRICED SUPPLY OF FOOD AND FIBER.

O TVA'S ECONOMIC AND COMMUNITY DEVELOPMENT PROGRAMS ARE NOT CONDUCTED IN ISOLATION, BUT ARE CARRIED OUT IN PART OF AN INTEGRATED APPROACH TO REGIONAL DEVELOPMENT. THEY ARE SERVING AS MODELS BEING ADOPTED IN OTHER STATES AND IN OTHER REGIONS.

O AND, FINALLY, MR. CHAIRMAN, TVA HAS SERVED AS A CONTINUING EXPERIMENT IN REGIONAL INTEGRATED PLANNING FOR MORE THAN 50 YEARS, AN EXPERIMENT IN WHAT GOVERNMENT CAN DO AS IT AFFIRMATIVELY RESPONDS TO THE NEEDS OF PEOPLE. IT'S BEEN AN EXPERIMENT THAT HAS PAID OFF FOR THE REGION AND THE NATION.

I CAN OFFER NO BETTER CONCLUSION TO THIS TESTIMONY THAN TO REPEAT PRESIDENT REAGAN'S OWN WORDS ON THE OCCASION OF TVA'S 50TH ANNIVERSARY CELEBRATION. PRESIDENT REAGAN WROTE:

. . . THAT TVA HAS BEEN A SUCCESS, NO ONE CAN DISPUTE. IT IS THE NATION'S LARGEST POWER SYSTEM. FLOODING ON THE TENNESSEE HAS BEEN CONTROLLED BY TVA DAMS. FERTILIZER FROM TVA PLANTS ENRICHES CROPLANDS THROUGHOUT THE COUNTRY. PRIVATE INDUSTRY HAS \$4 BILLION INVESTED IN INDUSTRIAL FACILITIES ALONG THE TENNESSEE RIVER PROVIDING 45,000 JOBS. AND AGRICULTURAL RESEARCH BY TVA SCIENTISTS HAS BENEFITED FARMERS ALL OVER THE WORLD. . . .

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CHART 1
APRIL 1985
COMPARISON OF RESIDENTIAL POWER COSTS
TVA AND UTILITIES IN THE SOUTHEASTERN US
1,000 KWH

FLORIDA POWER CORP.	\$80.58
TAMPA ELECTRIC CO.	\$77.44
GULF POWER CO.	\$77.26
SOUTH CAROLINA ELECTRIC & GAS CO.	\$75.16
CAROLINA POWER & LIGHT CO. (SC)	\$72.62
SAVANNAH ELECTRIC & POWER CO.	\$72.50
CAROLINA POWER & LIGHT CO. (NC)	\$69.99
ARKANSAS POWER & LIGHT CO.	\$68.58
ALABAMA POWER CO.	\$68.44
VIRGINIA ELECTRIC & POWER CO.	\$68.23
CENTRAL LOUISIANA ELECTRIC CO.	\$67.36
GULF STATES UTILITIES CO.	\$66.89
DUKE POWER CO. (NC)	\$66.10
MISSISSIPPI POWER & LIGHT CO.	\$65.22
SOUTHWESTERN ELECTRIC POWER CO.	\$61.22
MISSISSIPPI POWER CO.	\$60.96
DUKE POWER CO. (SC)	\$59.96
LOUISVILLE GAS & ELECTRIC CO.	\$59.46
APPALACHIAN POWER CO.	\$59.21
GEORGIA POWER CO.	\$58.96
LOUISIANA POWER & LIGHT CO.	\$58.30
NEW ORLEANS PUBLIC SERVICE, INC.	\$57.20
KENTUCKY UTILITIES CO.	\$55.74
KENTUCKY POWER CO.	\$52.94
KINGSPORT POWER CO.	\$51.35
TVA RP-K	\$47.06

CHART 2
APRIL 1985
COMPARISON OF INDUSTRIAL POWER COSTS
TVA AND UTILITIES IN THE SOUTHEASTERN U S
20,000 KW AND 13,140,000 KWH

GULF STATES UTILITIES CO.	\$693,560
TAMPA ELECTRIC CO.	\$681,398
SAVANNAH ELECTRIC & POWER CO.	\$664,864
FLORIDA POWER CORP.	\$656,341
CENTRAL LOUISIANA ELECTRIC CO.	\$624,772
CAROLINA POWER & LIGHT CO. (SC)	\$603,603
MISSISSIPPI POWER & LIGHT CO.	\$601,951
CAROLINA POWER & LIGHT CO. (NC)	\$601,809
GULF POWER CO.	\$580,805
SOUTHWESTERN ELECTRIC POWER CO.	\$570,561
NEW ORLEANS PUBLIC SERVICE, INC.	\$560,595
LOUISIANA POWER & LIGHT CO.	\$555,675
MISSISSIPPI POWER CO.	\$552,534
ARKANSAS POWER & LIGHT CO.	\$544,831
SOUTH CAROLINA ELECTRIC & GAS CO.	\$524,425
DUKE POWER CO. (NC)	\$523,307
LOUISVILLE GAS & ELECTRIC CO.	\$508,672
ALABAMA POWER CO.	\$504,319
KENTUCKY UTILITIES CO.	\$501,419
TVA GP-K	\$495,132
GEORGIA POWER CO.	\$491,011
DUKE POWER CO. (SC)	\$489,128
VIRGINIA ELECTRIC & POWER CO.	\$475,113
KINGSPORT POWER CO.	\$451,575
APPALACHIAN POWER CO.	\$411,466
KENTUCKY POWER CO.	\$388,580

CHART 3
TVA ACTUAL APPROPRIATIONS
BY FISCAL YEARS

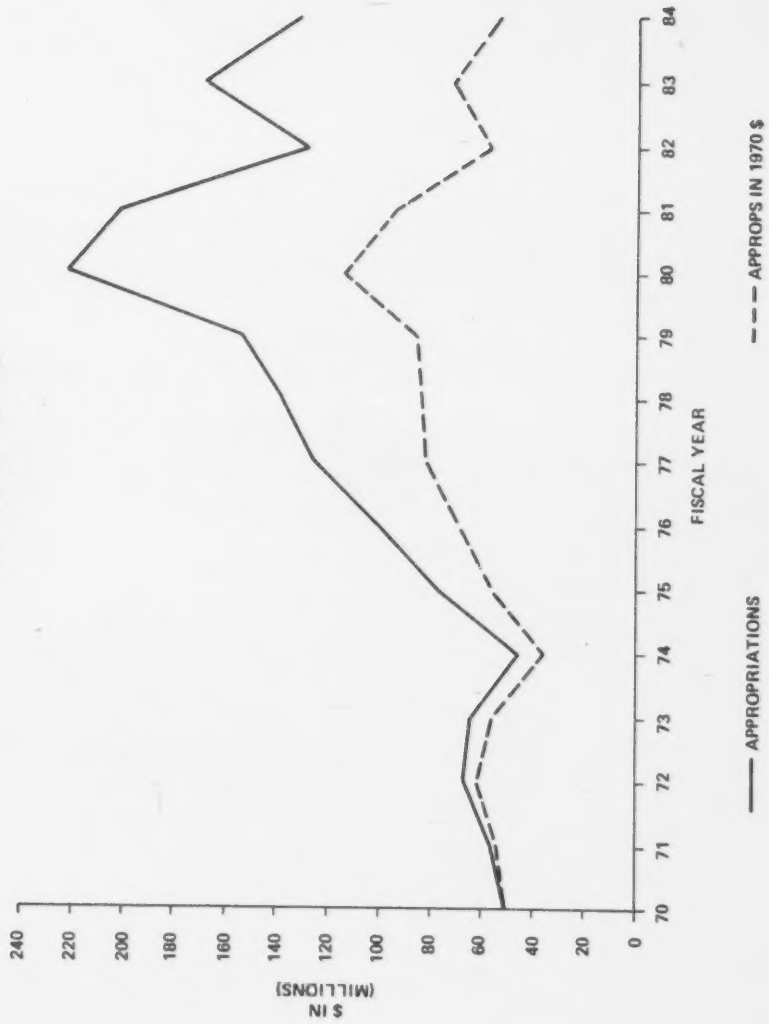


CHART 4

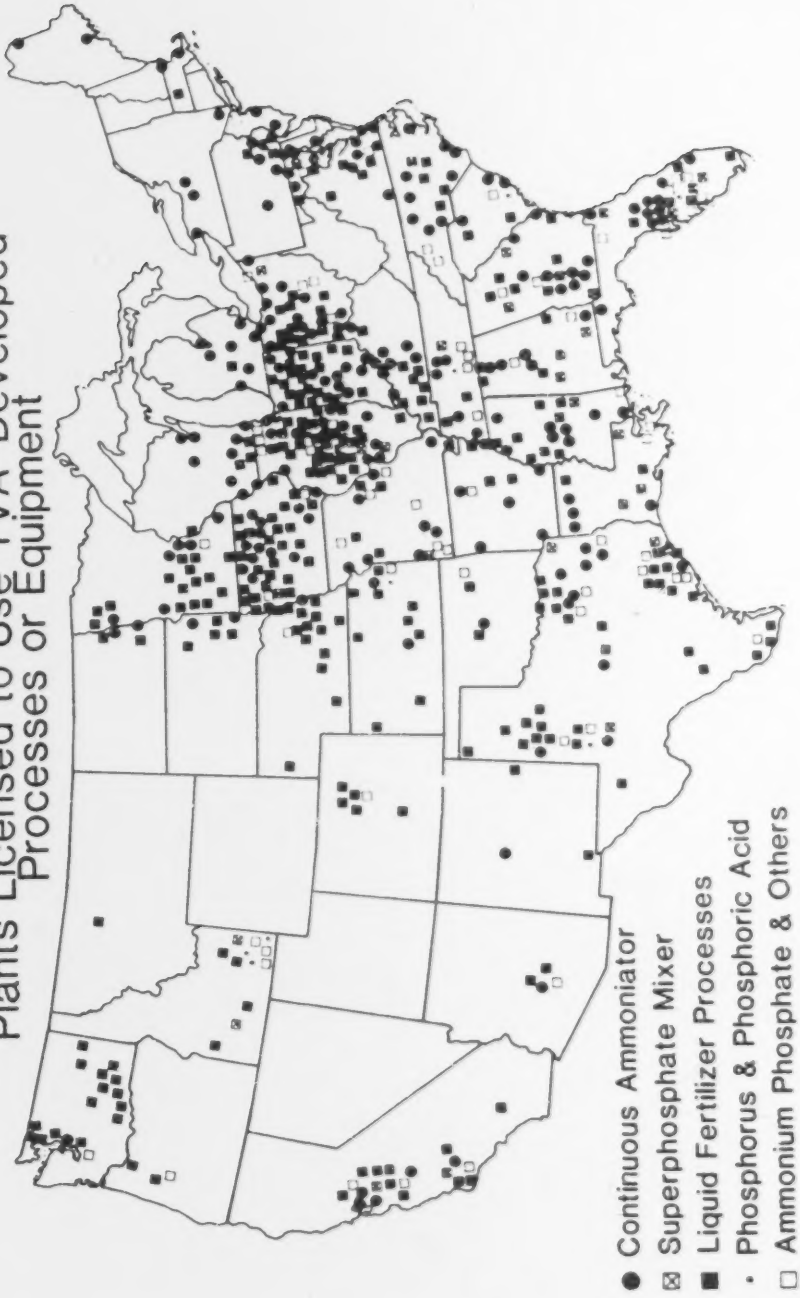
Plants Licensed to Use TVA-Developed
Processes or Equipment

CHART 5
TVA'S EFFECT ON THE DISTRIBUTION OF
FEDERAL SPENDING: 1984

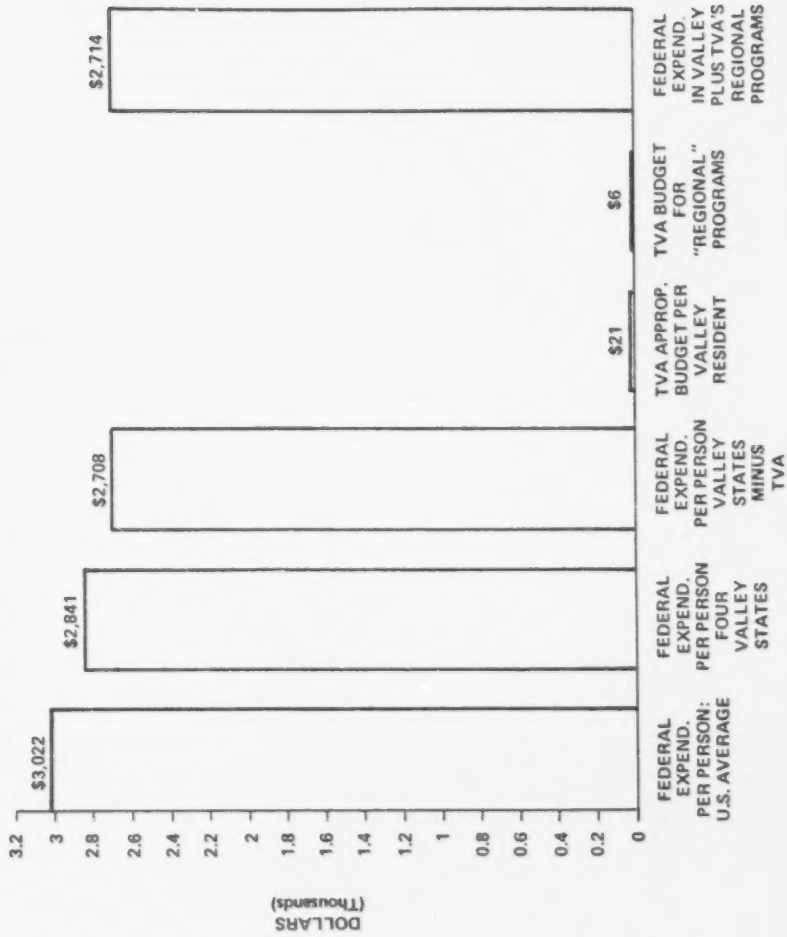
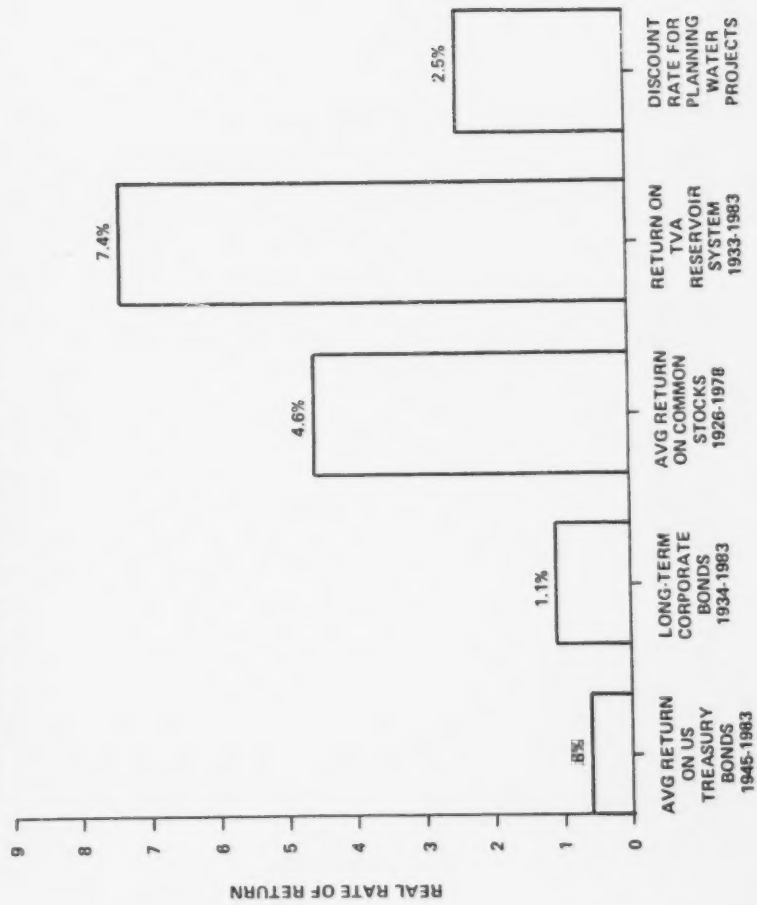


CHART 6
COMPARISON OF YIELDS:
TVA RESERVOIR SYSTEM AND ALTERNATIVE INVESTMENTS



REMARKS BY RICHARD M. FREEMAN, DIRECTOR
TENNESSEE VALLEY AUTHORITY
BEFORE THE UNITED STATES SENATE
SUBCOMMITTEE ON REGIONAL AND COMMUNITY DEVELOPMENT
JULY 15, 1985, WASHINGTON, D. C.

OUR NATION, MR. CHAIRMAN, IS BLESSED WITH AN ABUNDANCE OF NATURAL RESOURCES--THE TENNESSEE VALLEY REGION PARTICULARLY SO. BUT WHEN TVA WAS CREATED IN 1933, THE TENNESSEE VALLEY HAD SOME OF THE MOST ABUSED AND NEGLECTED LAND AND WATER IN THE UNITED STATES. THE CONSEQUENCES OF THAT NEGLECT AND ABUSE COULD BE SEEN ON THE FACE OF THE LAND AND ON THE FACES OF THE REGION'S PEOPLE WHOSE INCOME LEVEL, DUE IN NO SMALL PART TO THIS NEGLECT AND ABUSE, STOOD AT LESS THAN HALF THE NATIONAL AVERAGE.

THE TENNESSEE VALLEY AUTHORITY WAS ESTABLISHED AS A REALIZATION OF THE DREAM OF THE "PRAIRIE REPUBLICAN," SENATOR GEORGE NORRIS, TO HELP CORRECT THOSE CONDITIONS AND TO SERVE AS A NATIONAL MODEL FOR DOING SO. FOR BOTH SENATOR NORRIS AND PRESIDENT ROOSEVELT, TVA WAS TO BE AN EXPERIMENT IN FEDERAL GOVERNMENT.

AS AN EXPERIMENT, TVA WAS ESTABLISHED WITH AN ENTIRE WATERSHED AS ITS CRUCIBLE--A WATERSHED STRETCHING INTO SEVEN STATES AND ENCOMPASSING MORE THAN A HUNDRED COUNTIES AND EVEN MORE VILLAGES, TOWNS, AND CITIES. THE OBJECT OF THE EXPERIMENT WAS TO TEST THE PROPOSITION THAT A REGION'S LIFE SUSTAINING RESOURCES OF LAND, WATER AND AIR ARE INEXTRICABLY TIED TOGETHER IN NATURE'S UNITY AND THAT THE WISE USE OF ONE DEPENDS ON THE WISE USE OF OTHERS.

IF THE EXPERIMENT WAS SUCCESSFUL, IT WAS TO SERVE AS A NATIONAL DEMONSTRATION FOR DEVELOPING NATURAL RESOURCES IN WAYS THAT WOULD PERMIT GROWTH WITHOUT DESTROYING THE VERY BASIS THAT NURTURES ALL LIFE.

WHILE THE EXPERIMENT HAS BEEN IMPERFECT IN SOME WAYS, THE EVIDENCE IS ON THE SIDE OF SUCCESS. WHAT BEGAN AS A NATIONAL EXPERIMENT HAS, INDEED, TURNED INTO A NATIONAL DEMONSTRATION THAT CONTINUES TO HELP THIS NATION FACE MAJOR ISSUES THROUGH THE TESTING AND DISSEMINATION OF NEW TECHNOLOGIES, NEW RESEARCH APPROACHES, AND RELEVANT RESOURCE MANAGEMENT PROGRAMS.

WHAT BEGAN AS A UNIQUE NATIONAL EXPERIMENT, MR. CHAIRMAN, HAS MATURED INTO A TRUE NATIONAL ASSET. A BRIEF OVERVIEW OF TVA'S RESOURCE DEVELOPMENT EFFORTS WILL HELP ESTABLISH THIS POINT.

BUT BEFORE WE GET INTO A DESCRIPTION OF THESE EFFORTS, LET'S STEP BACK AND TAKE A LOOK AT THE LEVEL OF ANNUAL

CONGRESSIONAL APPROPRIATIONS THAT GO TO SUPPORT TVA'S REGIONAL DEVELOPMENT PROGRAMS. EACH YEAR CONGRESS APPROPRIATES FUNDS FOR A VARIETY OF PROGRAMS THAT FALL WITHIN TVA'S MULTIPURPOSE MISSION.

IN 1970, FIFTEEN YEARS AGO, TVA'S APPROPRIATION FROM CONGRESS WAS ABOUT \$50 MILLION. SINCE THEN, APPROPRIATIONS HAVE RANGED FROM A LOW OF \$46 MILLION IN 1974 TO A HIGH OF \$222 MILLION IN 1980. IN FISCAL YEAR 1984, CONGRESSIONAL APPROPRIATIONS CAME TO \$132 MILLION. WHEN INFLATION IS TAKEN INTO ACCOUNT, THE 1984 APPROPRIATION IS ROUGHLY EQUIVALENT TO THE 1970 APPROPRIATION. IT IS ALSO RELEVANT TO COMPARE 1980 WITH 1984 APPROPRIATIONS. IF THE LARGE CAPITAL APPROPRIATION IN 1980 FOR THE START OF A COAL GASIFICATION PLANT IS REMOVED, THE 1984 APPROPRIATION IS STILL 40 PERCENT LESS THAN THE 1980 APPROPRIATION IN REAL DOLLARS.

FURTHER CUTS WOULD CRITICALLY JEOPARDIZE TVA'S NONPOWER PROGRAMS THAT SERVE THE REGION AND THE NATION SO WELL--PROGRAMS SUCH AS TVA'S NATIONAL FERTILIZER DEVELOPMENT CENTER.

NATIONAL FERTILIZER DEVELOPMENT CENTER

FOR SEVERAL DECADES, A BASIC CHALLENGE OF AMERICAN AGRICULTURE HAS BEEN TO GET MORE PRODUCTIVITY OUT OF A DWINDLING NUMBER OF ACRES. THE TECHNOLOGICAL AND AGRICULTURAL RESPONSE TO THAT CHALLENGE HAS BEEN NOTHING SHORT OF ASTOUNDING. OUR FARMERS ARE FEEDING A POPULATION 75 PERCENT LARGER THAN IN THE 1930S, AND THEY ARE DOING SO ON LESS ACRES OF AVAILABLE CROPLAND. AND, ALTHOUGH OUR FARMERS CONSTITUTE LESS THAN ONE TENTH OF ONE PERCENT OF THE WORLD'S POPULATION, THEY PRODUCE 25 PERCENT OF THE WORLD'S FOOD SUPPLY--BRINGING INTO OUR NATION'S ECONOMY BETWEEN \$30 AND \$40 BILLION A YEAR IN EXPORT TRADE.

THE USE OF FERTILIZER ACCOUNTS FOR ABOUT 40 PERCENT OF THIS ELEVATED AGRICULTURAL PRODUCTIVITY. AND A KEY TO THE DEVELOPMENT AND CONTINUAL IMPROVEMENT OF FERTILIZER HAS BEEN TVA'S NATIONAL FERTILIZER DEVELOPMENT CENTER--THE NATION'S ONLY FACILITY DEALING WITH ALL PHASES OF FERTILIZER RESEARCH. HERE AMMONIUM NITRATE FERTILIZER WAS DEVELOPED FOR COMMERCIAL PRODUCTION. HERE GRANULATED AND FLUID FERTILIZERS WERE INTRODUCED. HERE NEW ENERGY-SAVING MANUFACTURING PROCESSES WERE FIRST PERFECTED.

THROUGH AN EFFECTIVE TECHNOLOGY TRANSFER PROCESS AND A CLOSE-WORKING PARTNERSHIP WITH THE FERTILIZER INDUSTRY, MORE

THAN 660 LICENSES HAVE BEEN ISSUED TO THE FERTILIZER INDUSTRY FOR THE NONEXCLUSIVE USE OF TVA DEVELOPMENTS.

THESE LICENSES HAVE GONE TO 390 COMPANIES FOR USE IN AT LEAST 579 PLANTS IN 39-STATES. TVA FERTILIZERS AND FERTILIZER-RELATED TECHNOLOGIES ARE NOW USED IN THE PRODUCTION OF THREE-FOURTHS OF ALL FERTILIZERS.

THE ACCUMULATED BENEFITS TO THE NATION OF TVA'S NATIONAL FERTILIZER DEVELOPMENT CENTER (NFDC) HAVE FAR EXCEEDED THE CENTER'S TOTAL COST. WHILE I TEND TO BE SKEPTICAL OF BENEFIT-COST RATIOS, I FIND THE ESTIMATED 20 TO 1 RATIO FOR THE NATIONAL FERTILIZER DEVELOPMENT CENTER TO BE SUFFICIENTLY HIGH TO PERMIT LITTLE ARGUMENT THAT THE BENEFITS SIGNIFICANTLY OUTWEIGH THE COSTS. WHETHER IT'S 20 TO 1, 10 TO 1, OR EVEN 2 TO 1, IT'S STILL A GOOD INVESTMENT FOR THE NATION.

I SHOULD ALSO MENTION THAT ABOUT 80 PERCENT OF THE DEVELOPMENTAL COST OF NEW FERTILIZERS IS BORNE BY THE FERTILIZER INDUSTRY AND FARMERS THROUGH THE PURCHASE OF EXPERIMENTAL FERTILIZERS.

THERE IS MORE WORK TO BE DONE IN FERTILIZER RESEARCH. MUCH OF THE PHOSPHATE USED IN FERTILIZER COMES FROM PHOSPHATE ROCK. BUT THE AMOUNT OF HIGH QUALITY PHOSPHATE ROCK, NOW MINED MOSTLY

IN FLORIDA, IS DIMINISHING. TVA IS WORKING ON A LABORATORY PROCESS THAT PROMISES TO YIELD AS MUCH PHOSPHATE FROM THE LARGE DEPOSITS OF LOW QUALITY PHOSPHATE ROCK AS CURRENT TECHNOLOGIES YIELD FOR HIGH QUALITY ROCK. IF THIS PROCESS CAN BE SUCCESSFULLY MOVED FROM THE LABORATORY TO COMMERCIAL PRODUCTION, AMERICAN AGRICULTURE AND AMERICAN CONSUMERS WILL SAVE MILLIONS OF DOLLARS BY TAKING ADVANTAGE OF LARGE DEPOSITS OF LOW QUALITY PHOSPHATE ROCK AVAILABLE IN THIS COUNTRY, AND THE U.S. CAN CONTINUE TO BE SELF-SUFFICIENT IN THIS CRITICAL FERTILIZER INGREDIENT.

ANOTHER PROBLEM BEING TACKLED THROUGH RESEARCH IS THE AMOUNT OF NITROGEN IN NITROGEN FERTILIZERS THAT IS BEING LOST TO CROPS DUE TO LEECHING, WASHING AWAY OR ESCAPING INTO THE ATMOSPHERE. ON THE AVERAGE, ABOUT ONE FORTH OF THE NITROGEN IN NITROGEN FERTILIZERS IS LOST AS NUTRIENTS IN THESE WAYS. SCIENTISTS AT THE NFDC ARE WORKING ON CHEMICAL ADDITIVES FOR EXISTING FERTILIZERS THAT WILL CUT NITROGEN LOSS, AS WELL AS NEW FERTILIZERS AND FERTILIZER APPLICATION PROCESSES THAT WILL GET MORE OF THE NITROGEN NUTRIENTS TO CROPS.

IN MANY CASES, FERTILIZERS ARE SIMPLY WASHED AWAY WITH TOPSOIL AND END UP IN NEARBY STREAMS AND RIVERS. THIS AMOUNTS TO A DOUBLE LOSS--A LOSS OF NUTRIENTS AND A LOSS OF WATER QUALITY. WHILE PART OF THIS PROBLEM CAN BE DEALT WITH THROUGH THE DEVELOPMENT OF LESS TOXIC FERTILIZERS, THE PROBLEM CAN ALSO

BE ADDRESSED IN A MORE FUNDAMENTAL WAY THROUGH PROGRAMS THAT CONTROL SOIL EROSION.

SOIL EROSION

SOIL EROSION WAS ONE OF THE EARLIEST CONCERNS FOR TVA. IN THE 1930S, 7 MILLION OF THE VALLEY'S 12 MILLION ACRES OF CLEARED LAND WERE SUFFERING FROM SERIOUS SOIL EROSION, WITH HUGE 50-FOOT GULLEYS AN ALL TOO COMMON SIGHT. THE PROBLEM WAS THE MOST SERIOUS IN THE EASTERN PORTION OF THE VALLEY WHERE ROLLING HILLS DOMINATE THE TOPOGRAPHY. EROSION OF THAT MAGNITUDE NOT ONLY DIMINISHED AGRICULTURAL PRODUCTIVITY, IT ALSO THREATENED TO CLOG UP STREAMS AND RESERVOIRS, RENDERING USELESS THE WATERWAY TVA WAS CREATING.

A COOPERATIVE NETWORK OF DEMONSTRATION FARMS BROUGHT IMPROVED AGRICULTURAL PRACTICES TO VALLEY FARMERS, ESPECIALLY IN THE EASTERN REGION WHERE ROLLING HILLS DOMINATE, AND HELPED REDUCE THE DAMAGE OF EROSION.

BUT THE CHANGING ECONOMICS OF FARMING IN THE 1970S, BROUGHT SOIL EROSION BACK TO THE VALLEY REGION, BUT THIS TIME TO ITS WESTERN PORTION WHERE INTENSIVE FARMING DOMINATES THE FLAT LAND STRETCHING OUT TO THE MISSISSIPPI RIVER.

TO ADDRESS THE REEMERGENCE OF SOIL EROSION, TVA AND THE U.S. DEPARTMENT OF AGRICULTURE SIGNED AN AGREEMENT IN 1979 TO OFFER A VARIETY OF SOIL EROSION CONTROL MEASURES IN THE WESTERN

PORTION OF TVA'S SERVICE REGION, WHERE EROSION RATES WERE AMONG THE WORST IN THE NATION. WITH COOPERATION FROM STATE AGENCIES AND UNIVERSITIES, THIS PROGRAM ACHIEVED DRAMATIC RESULTS. IN FOUR SHORT YEARS, THE USE OF NO-TILL FARMING PRACTICES, WHICH REDUCE SOIL EROSION SIGNIFICANTLY, INCREASED IN THE TARGETED AREA FROM 40,000 ACRES TO OVER 225,000 ACRES. USING THESE MEASURES AND OTHERS, EROSION WAS CUT BY 74 PERCENT ON ABOUT 100 DEMONSTRATION FARMS--SAVING ALMOST 1.2 MILLION TONS OF TOPSOIL EACH YEAR ON THESE FARMS ALONE. NOT ONLY WAS THIS PROGRAM AN ENVIRONMENTAL PLUS, IT WAS AN ECONOMIC BONUS AS WELL. CROP YIELDS INCREASED, AND PRODUCTION COSTS WENT DOWN.

THE LATEST CHAPTER IN THE STRUGGLE AGAINST SOIL EROSION IS NOW BEING WRITTEN THROUGH A COOPERATIVE PROJECT AMONG TVA, STATE AGRICULTURAL AGENCIES, STATE UNIVERSITIES AND THE U.S. DEPARTMENT OF AGRICULTURE. IT'S CALLED THE "LAND AND WATER 201 PROGRAM." THE 201 REFERS TO THE TOTAL NUMBER OF COUNTIES IN THE TVA REGION AND SIGNIFIES THAT THE PROGRAM'S EROSION CONTROL MEASURES WILL BE AVAILABLE TO FARMS THROUGHOUT THE VALLEY.

THE BENEFITS OF LAND AND WATER 201 HAVE ALREADY BEEN RECOGNIZED IN WASHINGTON AND FELT ON VALLEY FARMS. IT HAS BEEN CALLED A NATIONAL MODEL FOR INTERAGENCY CONSERVATION EFFORTS BY SECRETARY OF AGRICULTURE JOHN BLOCK. AND IN THE VALLEY REGION FARMERS HAVE WITNESSED ITS IMPACT DIRECTLY WHERE SOIL LOSSES HAVE BEEN REDUCED AN AVERAGE OF 4 TONS PER YEAR, AND IN SOME

INSTANCES CUT FROM 30 TONS TO 2 TONS.

I NEED NOT REMIND YOU, MR. CHAIRMAN, THAT SOIL EROSION IS NOT JUST A VALLEY PROBLEM. IT'S A NATIONAL PROBLEM.

FLOOD ZONE PLANNING

THERE IS ANOTHER PROBLEM OF NATIONAL SCOPE THAT TVA IS WORKING ON THAT HAS A DIRECT LINK BACK TO THE AGENCY'S EARLIEST DAYS.

BEFORE THE CONSTRUCTION OF TVA'S DAMS AND RESERVOIRS, LOW-LYING LANDS ALONG THE TENNESSEE RIVER WERE SUBJECTED TO TORRENTIAL FLOODS WHICH THREATENED LIFE AND RESULTED IN ECONOMIC DEVASTATION.

FLOODING OF THAT MAGNITUDE WAS BROUGHT UNDER CONTROL BY TVA. YET MINOR FLOODING PERSISTS TODAY, ESPECIALLY ALONG THE VALLEY'S SMALLER RIVERS AND STREAMS. IN THESE SITUATIONS, THE COSTS OF STREAM CHANNELIZATION OR DAM BUILDING USUALLY OUTWEIGH THE ECONOMIC AND ENVIRONMENTAL GAINS.

BY THE 1950S, IT BECAME APPARENT THAT STRUCTURAL FLOOD CONTROL PROJECTS, DID NOT PROVIDE THE FULL ANSWER FOR DEALING WITH FLOODS. THE RESULT WAS THE CREATION OF TVA'S FLOOD MANAGEMENT PROGRAM, WHICH MAKES AVAILABLE DETAILED FLOODING DATA AND MODEL ORDINANCES TO LOCAL COMMUNITIES AND ENCOURAGES THEIR USE AS COMMUNITIES DEVELOP LAND-USE PLANS AND AS THEY ZONE FOR GROWTH. THE PRINCIPLE BEHIND THE PROGRAM IS

RELATIVELY SIMPLE; IF YOU CAN'T KEEP FLOODS AWAY FROM PEOPLE, KEEP PEOPLE AND BUILDINGS AWAY FROM FLOODS AND OFF OF FLOOD PRONE LANDS.

TVA'S HAS BEEN NATIONALLY RECOGNIZED AS A PIONEER IN FLOOD ZONE PLANNING. ITS COOPERATIVE FLOOD ZONE PLANNING PRACTICES AND MODEL ZONING ORDINANCES HAVE BEEN ADOPTED IN STATES ACROSS THE COUNTRY.

RESERVOIR WATER QUALITY

AS HELPFUL AS TVA'S DAMS HAVE BEEN IN CONTROLLING FLOODS, TVA'S ONCE-YOUNG RESERVOIRS HAVE MATURED AND COSTLY WATER QUALITY PROBLEMS HAVE RESULTED.

SIGNS OF THAT MATURITY FIRST APPEARED ABOUT A DECADE AGO WHEN OUR RESEARCHERS OBSERVED REDUCTIONS IN THE WATER'S DISSOLVED OXYGEN CONTENT. AS RESERVOIRS AGE, ORGANIC MATERIALS INCREASE, ESPECIALLY AT DEEPER LEVELS, AND THE AMOUNT OF OXYGEN DECREASES. THE DEPLETION OF OXYGEN DRAINS A RESERVOIR'S VITALITY AND AFFECTS THE QUALITY OF WATER THAT FLOWS DOWNSTREAM FROM THE DAM'S TURBINES WHICH TYPICALLY DRAW WATER FROM THE RESERVOIR'S LOWER DEPTHS WHERE OXYGEN DEPLETION IS USUALLY THE GREATEST.

CONSEQUENTLY, WATER QUALITY DOWNSTREAM SUFFERS AND ITS

ABILITY TO SUSTAIN AQUATIC LIFE IS DIMINISHED. THIS CONDITION IS COMPOUNDED WHEN A SERIES OF DAMS AND RESERVOIRS IS INVOLVED--AS ON THE TENNESSEE RIVER.

RECOGNIZING THIS PROBLEM, TVA BEGAN A THREE-YEAR EXPERIMENTAL PROGRAM TO IMPROVE DISSOLVED OXYGEN LEVELS DOWNSTREAM OF TVA DAMS. AS ONE EXAMPLE, EXPERIMENTAL DEVICES INSTALLED AT TVA'S NORRIS DAM HAVE SUBSTANTIALLY IMPROVED THE OXYGEN CONTENT DOWNSTREAM, ADDING AS MUCH AS A MILLION CUBIC FEET OF OXYGEN ON A HOT SUMMER DAY AND BRING DISSOLVED OXYGEN READINGS ONCE NEAR ZERO BACK TO NEAR NORMAL. THE COST OF "TURBINE AERATION," AS IT'S CALLED, IS REASONABLE AND ITS IMPACT ON HYDROGENERATION IS MINIMAL.

WITH 1,000 DAMS ACROSS THE NATION AFFECTED BY SIMILAR CONDITIONS, THIS SUCCESSFUL DEMONSTRATION WILL REACH BEYOND THE TENNESSEE VALLEY REGION TO RIVERS IN EVERY SECTION OF THE COUNTRY.

GROUNDWATER

AS AN INTEGRATED RESOURCE DEVELOPMENT AGENCY, TVA IS CONCERNED NOT JUST WITH THOSE WATERS THAT FLOW ABOVE THE GROUND BUT ALSO WITH THE WATERS THAT FLOW OR REST QUIETLY BELOW THE GROUND. AND THIS CONCERN IS HEIGHTENED BY ONE SIMPLE, YET

IMPORTANT, FACT; ALMOST TWO-THIRDS OF ALL RESIDENTS IN THE TENNESSEE VALLEY REGION RELY ON GROUNDWATER FOR THEIR DRINKING SUPPLY AND OTHER USES.

OUR REGION'S WATER REMAINS CLEANER THAN MOST. YET IN THE LAST FIVE YEARS, 2,400 CASES OF ACUTE GROUNDWATER-BORNE DISEASE HAVE BEEN REPORTED IN THE SEVEN VALLEY STATES. NEARLY 250 OF THESE CASES HAVE BEEN HEPATITIS, AND THERE HAS BEEN ONE FATALITY.

IN 1984, TVA SPEARHEADED AN EXTENSIVE EDUCATIONAL EFFORT IN EAST TENNESSEE TO SHOW LOCAL GOVERNMENTS WHAT ACTIONS THEY COULD TAKE TO PROTECT THEIR GROUNDWATER. WE PUT OUR CONSIDERABLE TECHNICAL EXPERTISE TO USE IN DEVELOPING AQUIFER MAPS, DESIGNING EFFECTIVE LAND USE PLANS, CREATING EDUCATIONAL PROGRAMS, AND ASSISTING LOCAL OFFICIALS IN DEVISING PLANS TO PROTECT THEIR RECHARGE AREAS. A RECENT PUBLICATION MAKES OUR FINDINGS AVAILABLE TO COMMUNITIES THROUGHOUT THE REGION AND NATION.

JUST LAST MONTH, THE CHAIRMAN OF TVA'S BOARD PRESENTED TESTIMONY BEFORE THIS COMMITTEE ON OUR GROUNDWATER-RELATED FINDINGS AND WHAT WE BELIEVE TO BE SOME OF THEIR STATE, REGIONAL AND NATIONAL IMPLICATIONS.

AIR QUALITY

WHAT WE HAVE LEARNED ABOUT MAINTAINING AIR QUALITY ALSO PROVIDES VALUABLE INFORMATION FOR THE NATION. YOU HAVE ALREADY HEARD, MR. CHAIRMAN, ABOUT TVA'S ENVIRONMENTAL CLEANUP OF ITS COAL BURNING PLANTS. IN SIX YEARS, TVA WENT FROM THE NATION'S SINGLE LARGEST AIR POLLUTER--RELEASING OVER 2 MILLION TONS OF SULFUR DIOXIDE ANNUALLY--TO AN ENVIRONMENTAL LEADER AMONG ELECTRIC UTILITIES. WE HAVE CUT OUR SULFUR DIOXIDE EMISSIONS IN HALF.

GOING THROUGH THIS PROCESS HAS ALSO ENCOURAGED TVA TO TAKE A POSITIVE STAND ON THE ACID RAIN CONTROVERSY. LAST YEAR, THE BOARD OF DIRECTORS ADVOCATED A POLICY OF FURTHER REDUCTION OF SULFUR AND NITROGEN OXIDES USING LEAST-COST CONTROL STRATEGIES AND HAS URGED THE PASSAGE OF NATIONAL LEGISLATION TO THIS END.

BUT TVA'S CONCERN FOR AIR QUALITY DOESN'T STOP WITH SULFUR DIOXIDE AND ACID RAIN.

YOU'VE HEARD THAT OUR ENERGY CONSERVATION PROGRAM IS GOOD ECONOMICS, WHICH IT IS. BUT IT'S ALSO GOOD FOR THE ENVIRONMENT. BY REDUCING PEAK DEMAND BY OVER 1,000 MEGAWATTS, WE'RE REDUCING OUR NEED FOR A LARGE STEAM PLANT OR NUCLEAR UNIT. AND A PLANT THAT WE DON'T HAVE TO BUILD SAVES RESOURCES

THAT CAN BE PUT TO OTHER USES. AND A PLANT WE DON'T HAVE TO BUILD MEANS LESS AIR POLLUTION AND LESS RADIOACTIVE WASTES TO HANDLE.

COST-EFFECTIVE ENERGY CONSERVATION REDUCES THE RISK OF POLLUTION--THERE'S SIMPLY NO DOUBT ABOUT IT. ALL OF OUR RESOURCES--OUR LAND, WATER AND AIR--ARE IN BETTER SHAPE AS A RESULT, AND OUR ECONOMY IS HEALTHIER AT THE SAME TIME.

WHETHER IT'S THE QUALITY AND USE OF OUR AIR, LAND OR WATER, TVA HAS A RESPONSIBILITY TO LOOK AFTER, AND TO THE EXTENT POSSIBLE, HELP CARE FOR THE REGION'S RESOURCES IN AN INTEGRATED WAY. TVA IS NOT JUST A LAND AGENCY, A WATER AGENCY, OR AN AIR QUALITY AGENCY, BUT A REGIONAL, INTEGRATED RESOURCE DEVELOPMENT AGENCY CONCERNED WITH EACH OF THESE FUNDAMENTAL RESOURCES AS THEY EXIST IN NATURE'S UNITY.

OUR CONCERN FOR THESE RESOURCES CONSTITUTES A MEANS TOWARD AN END, MR. CHAIRMAN, AND THAT END--AS STATED EXPLICITLY IN THE TVA ACT--IS "TO IMPROVE THE ECONOMIC AND SOCIAL WELL-BEING OF THE PEOPLE."

IT'S THE PEOPLE WHO ARE THE ULTIMATE RECIPIENTS OF AN IMPROVED AND MORE PRODUCTIVE RESOURCE BASE. AND IT'S THE PEOPLE WHO WILL ULTIMATELY SUSTAIN OR DENY ITS BENEFITS. THAT'S WHY TVA FROM ITS INCEPTION HAS OFFERED PROGRAMS DESIGNED TO TEACH PEOPLE ABOUT THEIR ENVIRONMENT. THOSE PROGRAMS BEGAN

WITH TVA'S FIRST PROJECT AT NORRIS DAM, AND THEY CONTINUE TODAY AT TVA'S LAND BETWEEN THE LAKES (LBL) AND THROUGH TVA'S UNIVERSITY-BASED ENVIRONMENTAL AND ENERGY EDUCATION CENTERS.

ENVIRONMENTAL EDUCATION

SINCE LBL'S CREATION 22 YEARS AGO, STUDENTS AND TEACHERS, FISHERMEN AND HUNTERS, BIOLOGISTS AND FARMERS, BIRD WATCHERS AND VACATIONERS HAVE COME TO LBL TO ENJOY AND LEARN. LAST YEAR ALONE, MORE THAN TWO MILLION VISITORS, REPRESENTING ALL 50 STATES AND 20 FOREIGN NATIONS, CAME TO THIS SPOT OF SOLITUDE AND BEAUTY.

LBL SERVES AS AN AMBASSADOR FOR THE ENTIRE NATION. ITS SEMINARS, INTERNSHIPS AND CONFERENCES DRAW NATURAL RESOURCE SPECIALISTS FROM AROUND THE GLOBE. ITS SUMMER PROGRAMS AND WORKSHOPS IN ASTRONOMY AND ANTHROPOLOGY, WILDLIFE PHOTOGRAPHY AND SOLAR ENERGY, TIMBER HARVESTING AND NO-TILL FARMING, EAGLE RESTORATION AND FRONTIER LIVING ENRICH EACH VISITOR'S APPRECIATION FOR THE ENVIRONMENT--ELEVATING AN ENJOYABLE EXPERIENCE INTO AN EDUCATIONAL ONE. THEY COME AWAY WITH A KEENER AWARENESS OF THE CONNECTIONS BETWEEN THE WAY WE LIVE AND THE ENVIRONMENT WE LIVE IN.

IN ADDITION TO THE LAND BETWEEN THE LAKES, THE IMPORTANT CONNECTIONS BETWEEN A REGION'S SOURCES OF ENERGY, ITS ENVIRONMENT AND ITS ECONOMY ARE BEING STRESSED THROUGH A

NETWORK OF UNIVERSITY-BASED ENVIRONMENTAL AND ENERGY EDUCATION CENTERS. THESE CENTERS PROVIDE TEACHER TRAINING, DEVELOP LEARNING MATERIALS FOR ELEMENTARY AND SECONDARY SCHOOLS, OFFER SPECIALIZED PROGRAMS FOR CITIZEN GROUPS, AND ENCOURAGE RESEARCH INTO ENVIRONMENTAL EDUCATION EFFORTS.

UNIVERSITY-BASED CENTERS, MODELED AFTER THE TVA EXPERIENCE, HAVE BEEN DEVELOPED IN CALIFORNIA, WISCONSIN, AND OKLAHOMA. HERE AGAIN, TVA DEMONSTRATIONS HAVE SERVED AS A MODEL FOR OTHERS.

CONCLUSION

OUR ROLE AS A NATIONAL DEMONSTRATION IS VITALLY IMPORTANT TO US, AND WE BELIEVE TO THE NATION. OUR WORK IN FERTILIZER RESEARCH, SOIL EROSION, FLOOD ZONE PLANNING, IMPROVING RESERVOIR WATER QUALITY, PROTECTING GROUNDWATER, AND ADDRESSING ONE THE NATION'S MOST IMPORTANT AIR QUALITY ISSUES GIVES YOU AN IDEA, OF WHAT WE MEAN WHEN WE SAY THAT TVA IS SERVING THE NATION WHILE HELPING A REGION.

ASIDE FROM OUR DIRECT CONTRIBUTIONS TO NATIONAL LIFE, WHAT OTHERS CAN LEARN FROM OUR EXPERIENCES, BOTH FROM OUR SUCCESSES AND FROM OUR MISTAKES, IS ONE OF OUR PRINCIPAL BENEFITS AND MOST LASTING LEGACIES.

AS MENTIONED, TVA WAS ESTABLISHED AS AN EXPERIMENT. AS ANY EXPERIMENT, IT IS MEANT TO BE LEARNED FROM, TO BE A SOURCE OF

TESTING AND DISSEMINATION. AND, AS AN EXPERIMENT, WE BELIEVE THAT TVA CONTINUES TO BE SUCCESSFUL, ESPECIALLY AS IT DEMONSTRATES TIME AND AGAIN THE USEFULNESS, AND EVEN NECESSITY, OF INTEGRATED, REGIONAL RESOURCE DEVELOPMENT. THIS PRINCIPLE IS THE BASIS OF TVA. ALTHOUGH PROGRAMS WILL CHANGE IN RESPONSE TO CHANGING NEEDS AND CONDITIONS, ADHERENCE TO THIS PRINCIPLE WILL BE THE TRUE HISTORIC TEST OF THE TENNESSEE VALLEY AUTHORITY.

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REMARKS BY JOHN B. WATERS, DIRECTOR
TENNESSEE VALLEY AUTHORITY
BEFORE THE UNITED STATES SENATE
SUBCOMMITTEE ON REGIONAL AND COMMUNITY DEVELOPMENT
JULY 15, 1985, WASHINGTON, D. C.

MR. CHAIRMAN, YOU HAVE ALREADY HEARD ABOUT TVA'S POWER PROGRAM AND ITS NATURAL RESOURCE DEVELOPMENT EFFORTS. I'D LIKE TO FOCUS FOR A LITTLE WHILE ON WHAT TVA ACCOMPLISHES THROUGH ITS CONGRESSIONALLY-FUNDED PROGRAMS FOR COMMUNITY AND ECONOMIC DEVELOPMENT.

BUT, FIRST, I'D LIKE TO TAKE THE OPPORTUNITY TO LET YOU KNOW THAT, ALONG WITH CHAIRMAN DEAN, I'M A NATIVE OF THE TENNESSEE VALLEY AND HAVE HAD A CHANCE TO SEE FIRSTHAND WHAT TVA HAS HELPED THIS REGION DO. THERE ARE PLENTY OF PEOPLE WHERE I COME FROM THAT CAN REMEMBER WHAT LIFE WAS LIKE BEFORE TVA BROUGHT ELECTRICITY TO RURAL COMMUNITIES, OR CONTROLLED FLOODING ALONG THE RIVER, OR HELPED FARMERS GET MORE OUT OF THEIR LAND, OR HELPED CREATE NEW JOBS WHERE THEY WERE DESPERATELY NEEDED. THESE ARE THE KIND OF PEOPLE, MR. CHAIRMAN, THAT DON'T COME TO WASHINGTON TO TESTIFY, THEY

NEVER APPEAR ON ANYBODY'S LIST OF "EXPERT" WITNESSES, BUT THEY KNOW IN THEIR HEARTS WHAT TVA HAS MEANT TO THEM.

ALSO, BEFORE I GET INTO THE SPECIFICS OF OUR COMMUNITY AND ECONOMIC DEVELOPMENT EFFORTS, I WANT TO SAY A FEW WORDS ABOUT THE CONCEPT OF "REGIONAL DEVELOPMENT" BECAUSE I THINK THIS APPROACH TO ACHIEVING SOCIAL AND ECONOMIC PROGRESS IS VERY IMPORTANT--ESPECIALLY WHEN THE REGION IS A TRUE REGION AND NOT ONE JUST ARTIFICIALLY DRAWN ON A MAP.

THE TENNESSEE VALLEY WATERSHED IS JUST SUCH A REGION; IT IS TIED TOGETHER IN NATURE WITH A GEOGRAPHICAL, ECOLOGICAL, AND SOCIAL INTEGRITY. THAT'S NOT TO SAY THAT THERE'S NO DIVERSITY IN THE REGION--THERE IS--BUT THE AREA ENCOMPASSED BY THE TENNESSEE RIVER WATERSHED IS BEST VIEWED AS A WHOLE. UNIQUE OPPORTUNITIES AND PROBLEMS EXIST IN THIS REGION BECAUSE OF PARTICULAR CHARACTERISTICS OF THE NATURAL AND HUMAN RESOURCES THAT STRETCH FROM ONE END OF THE VALLEY TO THE OTHER. THESE PROBLEMS AND OPPORTUNITIES ARE BEST ADDRESSED THROUGH A COOPERATIVE REGIONAL APPROACH. AND A COOPERATIVE REGIONAL APPROACH IS JUST WHAT TVA STRIVES TO INCORPORATE INTO ITS COMMUNITY AND ECONOMIC DEVELOPMENT PROGRAMS.

JUST AS TVA'S EFFORTS TO HELP DEVELOP THE REGION'S NATURAL RESOURCES ARE GUIDED BY A CENTRAL PROPOSITION, TVA'S ECONOMIC AND COMMUNITY DEVELOPMENT PROGRAMS ARE ALSO GUIDED BY A SET OF PRINCIPLES BASED ON A PARTICULAR CONCEPTION OF WHAT A FEDERALLY-SUPPORTED REGIONAL DEVELOPMENT AGENCY SHOULD DO.

OUR VIEW IS THAT SUCH AN AGENCY SHOULD BUILD LOCAL INITIATIVE AND HELP COMMUNITIES STAND ON THEIR OWN TWO FEET, THAT LIMITED FEDERAL FUNDS SHOULD BE LEVERAGED THROUGH COOPERATIVE PROJECTS TO ATTRACT PRIVATE AND PUBLIC CONTRIBUTIONS AT THE LOCAL LEVEL, THAT SUCH COOPERATIVE PROJECTS SHOULD ADDRESS PRACTICAL, DOWN-TO-EARTH PROBLEMS OF LOCAL COMMUNITIES, AND THAT COMMUNITY AND ECONOMIC DEVELOPMENT SHOULD TAKE INTO FULL ACCOUNT THE CONTINUAL INTERPLAY BETWEEN HUMANS AND THEIR ENVIRONMENT.

WE ALSO BELIEVE FIRMLY THAT TVA SHOULD NOT BE OFFERING PROGRAMS THAT DUPLICATE THOSE OF OTHER GOVERNMENT AGENCIES, PROGRAMS THAT DON'T YIELD POSITIVE RESULTS, AND MOST ESPECIALLY, PROGRAMS THAT ARE NOT TRULY NEEDED. COMMON SENSE WOULD DICTATE THIS FOR ANY RESPONSIBLE GOVERNMENT ORGANIZATION.

AS A REGIONAL DEVELOPMENT AGENCY, MR. CHAIRMAN, TVA VIRTUALLY STANDS ALONE. THERE ARE FEW, IF ANY; OTHER FEDERAL AGENCIES WITH AN EXPLICIT RESPONSIBILITY FOR REGIONAL ECONOMIC DEVELOPMENT THAT ALSO HAVE A DIRECT INVOLVEMENT IN THE CREATION AND MANAGEMENT OF A REGION'S BASIC ENERGY AND NATURAL RESOURCE INFRASTRUCTURE. TVA IS UNIQUE IN ITS ABILITY TO GUIDE AND APPLY THE BENEFITS OF THIS INFRASTRUCTURE TO THE REGION'S SUSTAINED, BALANCED GROWTH. TVA'S POWER SYSTEM AND NATURAL RESOURCE DEVELOPMENT EFFORTS ARE PURPOSEFULLY MANAGED TO HELP THE REGION AND ITS COMMUNITIES PROSPER. WHILE TVA'S

CONGRESSIONALLY-FUNDED PROGRAMS SPECIFICALLY AIMED AT COMMUNITY AND ECONOMIC DEVELOPMENT ARE VITAL LINKS IN THE CHAIN, TVA'S OVERALL EFFORT TO BRING ABOUT PROGRESS IN THE REGION GOES FAR BEYOND THESE SPECIFIC INITIATIVES. AND THAT IS WHAT GIVES THE TENNESSEE VALLEY AUTHORITY AN EDGE WHEN IT COMES TO MAKING ECONOMIC DEVELOPMENT HAPPEN.

IN VIEWING TVA'S PROGRAMS THAT FOCUS SPECIFICALLY ON COMMUNITY AND ECONOMIC DEVELOPMENT, THE THEMES OF SELF-RELIANCE, COOPERATION, INTERDEPENDENCY AND PRACTICALITY ARE USEFUL GUIDES.

SELF-RELIANCE

TVA HELPS BUILD SELF-RELIANT COMMUNITIES BY LENDING A HAND, NOT A HANDOUT. SOMETIMES, A SMALL AMOUNT OF "SEED MONEY" IS NEEDED TO PRIME THE ECONOMIC PUMP, BUT THAT MONEY IS TYPICALLY LEVERAGED WITH LOCAL AND STATE CONTRIBUTIONS. THIS REFLECTS TVA'S BASIC BELIEF THAT COMMUNITY AND ECONOMIC DEVELOPMENT, IN MOST INSTANCES, SHOULD GROW FROM AND ENCOURAGE COMMUNITY SELF-SUFFICIENCY AND NOT SIMPLY CREATE A DEPENDENCY ON OUTSIDE FUNDS. I CAN ILLUSTRATE THIS PRINCIPLE AT WORK.

WORKING WITH LOCAL CHAMBERS OF COMMERCE AND OTHER DEVELOPMENT GROUPS, TVA'S TOWNLIFT PROGRAM PROVIDES TECHNICAL ASSISTANCE TO HELP LOCAL COMMUNITIES DEVISE SOUND STRATEGIES TO INCREASE THEIR TAX BASE, IMPROVE LOCAL MARKETS, AND CREATE NEW JOBS.

IN FISCAL '84, TOWNLIFT PLANNING AND DEVELOPMENT ASSISTANCE WAS PROVIDED TO 68 COMMUNITIES IN THE VALLEY REGION. LARGELY AS A RESULT, MORE THAN \$25 MILLION IN PRIVATE AND PUBLIC FUNDS WAS LEVERAGED TO IMPLEMENT DOWNTOWN RESTORATION AND BUSINESS DISTRICT REDEVELOPMENT PROJECTS. FOR EVERY DOLLAR INVESTED BY TVA IN TOWNLIFT PROJECTS, MORE THAN \$30 WAS ATTRACTED FROM OTHER PRIVATE AND PUBLIC INVESTORS.

THE SUCCESS OF TOWNLIFT IN CREATING JOBS AND UPGRADING THE APPEARANCE AND FUNCTIONING OF DOWNTOWN AREAS HAS LED TO ITS USE AS A MODEL FOR A NATIONAL PROGRAM SPONSORED BY THE NATIONAL TRUST FOR HISTORIC PRESERVATION. THAT PROGRAM IS CALLED "MAIN STREET USA."

COOPERATION

IN ORDER TO BUILD SELF-RELIANCE, YOU HAVE TO RESPECT LOCAL VALUES AND BE SENSITIVE TO LOCAL NEEDS, AND YOU HAVE TO BE WILLING TO COOPERATE. TVA'S COMMUNITY AND ECONOMIC DEVELOPMENT PROGRAMS DON'T ADOPT A HEAVY-HANDED APPROACH OF GOVERNMENTAL INTERVENTION. RATHER, WE EMPHASIZE THE NEED FOR COOPERATION AND LOCAL INVOLVEMENT.

THAT PRINCIPLE IS ILLUSTRATED BY OUR COOPERATIVE EFFORTS WITH LOCAL COMMUNITIES IN HELPING THEM BRING NEEDED SKILLS TO THEIR RESIDENTS.

FOR INSTANCE, IN TUPELO, MISSISSIPPI, TVA--IN COOPERATION WITH THE LOCAL EDUCATORS AND COMMUNITY LEADERS--HELPED DESIGN A SYSTEM FOR BRIDGING THE GAP BETWEEN THE SKILLS NEEDED BY THE COMMUNITY AND THOSE BEING TAUGHT IN SCHOOL. A "NEEDS ASSESSMENT" WAS CONDUCTED TO DETERMINE THE VOCATIONAL SKILLS NEEDED TO KEEP LOCAL BUSINESSES VITAL AND THEN A DETAILED PLAN AND COORDINATED VOCATIONAL CURRICULUM WAS DEvised TO MEET THOSE NEEDS. THIS, MR. CHAIRMAN, IS A FAR CRY FROM THE TYPE OF VOCATIONAL TRAINING THAT WAS AVAILABLE WHEN I WAS IN HIGH SCHOOL IN EAST TENNESSEE. AT THAT TIME, THE ONLY VOCATIONAL TRAINING THAT WAS OFFERED WAS A COURSE CALLED "VOCATIONAL AGRICULTURE," AND IF YOU WANTED VOCATIONAL TRAINING YOU TOOK IT WHETHER YOU, OR THE COMMUNITY, NEEDED IT OR NOT.

TO DATE, THE SUCCESS OF THE TUPELO MODEL FOR TECHNICAL CAREER DEVELOPMENT HAS ATTRACTED THE ATTENTION OF EDUCATORS AND BUSINESS LEADERS FROM FIVE STATES OUTSIDE OF THE TENNESSEE VALLEY AND FROM SEVERAL FOREIGN COUNTRIES.

INTERDEPENDENCY

IN ADDITION TO SELF-RELIANCE AND COOPERATION, ANOTHER IMPORTANT PRINCIPLE FOR TVA'S INITIATIVES IN COMMUNITY AND ECONOMIC DEVELOPMENT IS A RECOGNITION OF THE INTERDEPENDENCY BETWEEN ECONOMIC ACTIVITY AND ENVIRONMENTAL QUALITY. JUST AS NO REGION CAN BE EXPECTED TO PROSPER BEYOND THE ABILITIES OF

ITS PEOPLE, NEITHER CAN IT BE EXPECTED TO PROSPER IF ITS RESOURCES ~~HAVE~~ REACHED THEIR LIMITS OF GROWTH.

THE TENNESSEE VALLEY AUTHORITY IS VITALLY CONCERNED ABOUT THESE LIMITS AND THEIR EFFECTS ON ECONOMIC DEVELOPMENT, AND WE'RE ARE TOTALLY COMMITTED TO THE PROPOSITION THAT BALANCED GROWTH IS POSSIBLE THROUGH THE WISE USE AND CONSERVATION OF NATURAL RESOURCES. FURTHERMORE, WE PRACTICE WHAT WE PREACH.

FOR INSTANCE, BY CLEANING UP ITS OWN AIR POLLUTION, TVA IS MAKING IT POSSIBLE FOR OTHER INDUSTRIAL CONCERNS TO EXPAND OR LOCATE IN THE VALLEY REGION WITHOUT EXCEEDING EXISTING AIR QUALITY STANDARDS. AND WE'LL WORK WITH THEM IN MAKING SURE THE ENVIRONMENT REMAINS PROTECTED.

BY COOPERATING WITH OTHERS ALONG THE HOLSTON RIVER IN ACHIEVING A COST-EFFECTIVE SOLUTION TO WATER QUALITY PROBLEMS, TVA HOPES TO PAVE THE WAY FOR FURTHER RESIDENTIAL AND ECONOMIC DEVELOPMENT ALONG THAT RIVER. AND THE PRODUCTIVE LIMITS OF THIS REGION'S LANDS WOULD HAVE CERTAINLY BEEN REACHED BY NOW WITHOUT TVA'S FERTILIZER AND SOIL EROSION PROGRAMS.

THESE LIMITS TO GROWTH ARE REAL AND CONSTRAINING. ONE OF TVA'S CHIEF ASSETS AS A REGIONAL DEVELOPMENT AGENCY IS ITS ABILITY TO ADDRESS THESE LIMITS DIRECTLY, PARTICULARLY IN AN INTEGRATED FASHION.

PRACTICALITY

WHEN IT GETS DOWN TO THE REAL WORLD, THE PRINCIPLES OF SELF-RELIANCE, COOPERATION, AND INTERDEPENDENCY ARE IMPORTANT, BUT SO IS THE PRINCIPLE OF PRACTICALITY. AND THERE'S NO MORE PRACTICAL PROBLEM IN ANY REGION THAN HOW TO CREATE NEEDED, GOOD-PAYING JOBS.

IN COOPERATION WITH 160 ELECTRIC POWER DISTRIBUTORS ACROSS THE 7-STATE VALLEY REGION, TVA IS SHOWING HOW THIS PRACTICAL PROBLEM CAN BE SOLVED BY ASSISTING SMALL- AND MEDIUM-SIZED MANUFACTURING FIRMS MEET THE CHALLENGES OF EXPANSION.

DISTRIBUTORS OF TVA POWER HELP IDENTIFY COMPANIES WITH THE POTENTIAL FOR EXPANSION AND HELP COORDINATE TECHNICAL ASSISTANCE PROVIDED BY TVA. ASSISTANCE IS AVAILABLE IN ACHIEVING ENERGY EFFICIENCIES, IN PLANNING EXPANSIONS THAT ARE IN COMPLIANCE WITH ENVIRONMENTAL REGULATIONS, IN EMPLOYEE TRAINING, AND IN OTHER AREAS THAT HELP THESE FIRMS EXPAND EFFICIENTLY.

TO DATE, THIS PROGRAM HAS ASSISTED MORE THAN 300 COMPANIES, ALLOWING THEM TO EXPAND AND CREATE MORE THAN 10,000 NEW JOB-OPPORTUNITIES FOR VALLEY WORKERS. SINCE ONE OF THE AIMS OF THIS PROGRAM IS TO TRAIN UNEMPLOYED WORKERS AND PUT THEM TO WORK IN NEWLY CREATED JOBS, AN IMPORTANT SIDE EFFECT IS ACHIEVED. FOR EVERY DOLLAR INVESTED IN THE PROGRAM, \$20 IS SAVED IN STATE AND LOCAL UNEMPLOYMENT AND PUBLIC ASSISTANCE PAYMENTS.

THE DEPARTMENT OF ENERGY OF OREGON, THE STATE OF NORTH CAROLINA, AND THE NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION HAVE HELD PRELIMINARY MEETINGS WITH REPRESENTATIVES FROM OUR EXISTING INDUSTRIES PROGRAM TO EXPLORE THE POSSIBILITY OF SETTING UP SIMILAR PROGRAMS IN OREGON, MINNESOTA, NORTH CAROLINA, AND OTHER AREAS OUTSIDE THE VALLEY. HERE AGAIN, WE'RE TRYING THINGS OUT IN THE VALLEY REGION AND THEN SHARING OUR SUCCESSES WITH OTHERS.

THE PROGRAMS JUST MENTIONED AREN'T MEANT TO PROVIDE A COMPLETE CATALOG OF TVA'S ECONOMIC AND COMMUNITY DEVELOPMENT EFFORTS--FAR FROM IT. BUT THEY DO PROVIDE A SENSE OF THE GENERAL PRINCIPLES THAT GUIDE OUR EFFORTS IN THIS AREA. THESE PRINCIPLES ARE NOT STATIC CATEGORIES, INTO WHICH WE TRY TO FORCE-FIT SPECIFIC PROGRAMS. RATHER SOME OF OUR BEST PROGRAMS--LIKE THE ONE JUST DESCRIBED FOR EXPANDING INDUSTRIES--CROSS ALL BOUNDARIES.

WHETHER IT'S WORKING WITH OTHERS TO TAKE ADVANTAGE OF ECONOMIC OPPORTUNITIES OR MANAGING ITS OWN RESOURCES FOR THE ECONOMIC BENEFIT OF THE REGION, THE TENNESSEE VALLEY AUTHORITY SEES ONE OF ITS MAIN MISSIONS AS CARRYING OUT PROGRAMS THAT FOSTER THE SOCIAL AND ECONOMIC WELL-BEING OF THE REGION. OVER THE PAST 50 YEARS, THE PEOPLE OF THE VALLEY HAVE GROWN TO EXPECT THAT OF TVA. THEY HAVE ALSO GROWN TO EXPECT HELP, NOT A HANDOUT. AND THAT'S AS IT SHOULD BE.

BEFORE CONCLUDING OUR DISCUSSION OF TVA'S COMMUNITY AND ECONOMIC DEVELOPMENT PROGRAMS, MR. CHAIRMAN, WE FEEL COMPELLED TO SET THE RECORD STRAIGHT ON TWO POINTS OF MISUNDERSTANDING. ONE PERTAINS DIRECTLY TO OUR COMMUNITY AND ECONOMIC DEVELOPMENT EFFORTS AND THE OTHER TOUCHES ON A RELATED MATTER.

SOME PEOPLE HAVE ARGUED THAT THE FEDERAL INVESTMENT IN TVA'S COMMUNITY AND ECONOMIC DEVELOPMENT ACTIVITIES CONSTITUTES AN "UNFAIR" REGIONAL ADVANTAGE. AND SOME PEOPLE HAVE ARGUED THAT THE INVESTMENT IN TVA'S SYSTEM OF DAMS AND RESERVOIRS HAS NOT PAID OFF, EITHER FOR THE REGION OR FOR THE NATION. BOTH ARGUMENTS ARE ILL-FOUNDED AND BOTH NEED TO BE CORRECTED.

FAIRNESS

ON THE ISSUE OF FAIRNESS: THE VALLEY REGION IS NOT RECEIVING A DISPROPORTIONATE AMOUNT OF FEDERAL EXPENDITURES THROUGH THE COMMUNITY AND ECONOMIC DEVELOPMENT PROGRAMS OF TVA, OR EVEN THE EXPENDITURES OF TVA AS A WHOLE.

PUT IN ANOTHER WAY; IF YOU ASK THE QUESTION, "DO THE PEOPLE OF THE VALLEY REGION GAIN AN ADVANTAGE OVER PEOPLE IN OTHER REGIONS DUE TO CONGRESSIONAL APPROPRIATIONS TO TVA?" THE ANSWER IS, CLEAR AND SIMPLY, NO.

FIRST, IT'S IMPORTANT TO REALIZE THAT THERE IS A CONSIDERABLE VARIATION IN FEDERAL EXPENDITURES AMONG INDIVIDUAL STATES, OR REGIONS, FOR A NUMBER OF REASONS. THERE IS ALSO A

VARIATION IN THE PROGRAMS FOR WHICH THOSE EXPENDITURES ARE MADE--URBAN STATES RECEIVE MORE MASS TRANSIT FUNDING, RURAL STATES GET MORE SOIL CONSERVATION MONEY, AND SO ON. TO SEE IF ONE STATE, OR REGION, IS GAINING AN ADVANTAGE OVER ANOTHER, YOU NEED TO LOOK AT AVERAGES.

ON A PER CAPITA BASIS ACROSS THE COUNTRY, FEDERAL EXPENDITURES IN FISCAL YEAR 1984 AVERAGED \$3,022. ACCORDING TO THE BUREAU OF CENSUS, THE FOUR PRINCIPAL VALLEY STATES--ALABAMA, KENTUCKY, MISSISSIPPI AND TENNESSEE--RECEIVED ON AVERAGE \$2,841, OR 6 PERCENT LESS THAN THE NATIONAL AVERAGE.

HOWEVER, THIS AVERAGE INCLUDED ALL OF TVA'S EXPENDITURES AS FEDERAL EXPENDITURES, EVEN THOUGH ABOUT 96 PERCENT OF THESE EXPENDITURES ARE FINANCED COMPLETELY BY THE REGION'S RATEPAYERS, NOT THE NATION'S TAXPAYERS. IF TVA'S OWN EXPENDITURES ARE SUBTRACTED OUT BECAUSE THEY DON'T REPRESENT A TRUE FEDERAL EXPENDITURE, PER CAPITA FEDERAL SPENDING WOULD AVERAGE \$2,708 IN THE FOUR STATES, SLIGHTLY MORE THAN 10 PERCENT BELOW THE NATIONAL AVERAGE.

CLEARLY, THE FOUR PRINCIPAL VALLEY STATES ARE GAINING NO REGIONAL ADVANTAGE THROUGH FEDERAL EXPENDITURES.

TVA'S FEDERALLY APPROPRIATED BUDGET EXPRESSED PER VALLEY RESIDENT AMOUNTED TO ABOUT \$21 IN 1984. MUCH OF THIS, HOWEVER, IS ACCOUNTED FOR BY PROGRAMS THAT ARE CLEARLY NATIONAL, NOT REGIONAL, IN SCOPE, SUCH AS THE NATIONAL FERTILIZER DEVELOPMENT

CENTER. ALSO INCLUDED IN THIS FIGURE ARE TVA PROGRAMS WHICH PROVIDE SERVICES SIMILAR TO THOSE PROVIDED IN OTHER REGIONS BY OTHER FEDERAL AGENCIES, SUCH AS THE BUREAU OF RECLAMATION OR THE U.S. ARMY CORPS OF ENGINEERS. THEREFORE, THESE PARTICULAR PROGRAMS DON'T CONTRIBUTE TO ANY SORT OF "REGIONAL" ADVANTAGE.

IF NATIONALLY TARGETED PROGRAMS AND PROGRAMS WHOSE SERVICES ARE ANALOGOUS TO THOSE PROVIDED IN OTHER REGIONS BY OTHER AGENCIES ARE NETTED OUT, THE RESIDUAL COMES TO ABOUT \$6 PER VALLEY RESIDENT. THIS AMOUNT IS NOT ENOUGH TO WARRANT A CLAIM THAT THE TVA REGION IS GAINING AN EDGE DUE TO FEDERAL APPROPRIATIONS COMING THROUGH TVA.

TO TAKE IT BACK TO A NATIONAL LEVEL; IF THIS \$6 IS ADDED TO THE AVERAGE PER CAPITA FEDERAL SPENDING OF \$2,708 FOR THE FOUR PRINCIPAL VALLEY STATES, AN ADJUSTED FIGURE OF \$2,714 IS OBTAINED. THIS ADJUSTED FIGURE IS STILL ALMOST 10 PERCENT BELOW THE NATIONAL AVERAGE. THUS, MR. CHAIRMAN, TVA CLEARLY DOES NOT DISTORT OR REALLY EVEN INFLUENCE IN A DISCERNABLE WAY THE FLOW OF FEDERAL BUDGET FUNDS AMONG THE STATES.

EVEN WITH FEDERAL APPROPRIATIONS COMING THROUGH TVA, VALLEY STATES STILL LAG BEHIND THE NATIONAL AVERAGE IN FEDERAL EXPENDITURES, WHEN IT COULD BE ASSUMED THAT THESE STATES SHOULD BE GETTING MORE THAN AVERAGE DUE TO THEIR RELATIVELY HIGH CONCENTRATIONS OF LOW INCOME AND UNEMPLOYED FAMILIES.

RETURN ON INVESTMENT

ON THE ISSUE OF RETURN ON INVESTMENTS: IT IS IMPORTANT TO RECOGNIZE THAT AMERICAN TAXPAYERS AND TVA RATEPAYERS HAVE A CONSIDERABLE INVESTMENT IN TVA'S MULTIPURPOSE SYSTEM OF DAMS AND RESERVOIRS. THE NET INVESTMENT IN CURRENT YEAR PRICES IS ABOUT \$1.1 BILLION AND THE QUESTION OF AN APPROPRIATE RETURN ON THAT INVESTMENT HAS BEEN RAISED.

THE RETURN ON THAT INVESTMENT SHOULD TO BE CALCULATED IN TERMS OF THE TOTAL BENEFITS ACCRUED THROUGH FLOOD CONTROL, NAVIGATION, HYDROELECTRICITY AND RECREATION. THAT CALCULATION REVEALS A RETURN OF ALMOST EIGHT PERCENT IN INFLATION ADJUSTED DOLLARS.

(SHOW CHART SIX: COMPARISON OF YIELDS)

AS YOU CAN SEE, THE RETURN ON THE INVESTMENT IN TVA'S DAMS AND RESERVOIRS IS ALMOST TWICE THE INFLATION ADJUSTED AVERAGE RETURN ON COMMON STOCKS (1926-1978), AND MORE THAN SEVEN TIMES THE AVERAGE RETURN ON LONG-TERM CORPORATE BONDS (1934-1983) AND UNITED STATES TREASURY BONDS (1945-1983). IT IS ALSO IMPORTANT TO NOTE THAT THE RETURN ON TVA'S RESERVOIR SYSTEM IS ABOUT THREE TIMES GREATER THAN THE RATE OF RETURN THE CONGRESS HAS SPECIFIED TO BE USED IN PLANNING FEDERALLY FINANCED WATER PROJECTS, OR THAT GOOD PLANNING PRACTICE WOULD HAVE DICTATED.

THE ECONOMIC IMPACT OF TVA'S DAMS AND RESERVOIRS CAN ALSO BE DESCRIBED IN CONCRETE WAYS, MR. CHAIRMAN--WAYS THAT US NON-ECONOMISTS CAN BETTER UNDERSTAND. TVA'S 37 DAMS AND 14 MAIN AND AUXILIARY LOCKS ON THE TENNESSEE RIVER AND TRIBUTARIES CREATE 650 MILES OF NAVIGABLE WATERWAY AND 11,000 MILES OF SHORELINE. THE WATERWAY SYSTEM IS PRODUCING MORE THAN 17 BILLION KILOWATTHOURS OF ELECTRICITY EACH YEAR, AND IS SAVING SHIPPERS APPROXIMATELY \$160 MILLION PER YEAR IN FREIGHT COSTS. AND OVER THE YEARS, IT HAS PREVENTED ALMOST \$3 BILLION IN FLOOD DAMAGE.

IN ADDITION, SINCE 1945, PRIVATE INDUSTRY HAS INVESTED MORE THAN \$4.5 BILLION IN WATERFRONT FACILITIES. AND THESE FACILITIES HAVE EMPLOYED AS MANY AS 45,000 PEOPLE. THAT'S THE KIND OF ECONOMIC RETURN ALMOST ANYONE CAN UNDERSTAND.

CONCLUSION

THROUGH THE OPERATION OF OUR POWER SYSTEM, OUR WATERWAY SYSTEM, OUR NATURAL RESOURCE DEVELOPMENT PROGRAMS AND OUR COMMUNITY AND ECONOMIC DEVELOPMENT ACTIVITIES, WE ARE DOING WHAT WE CAN TO HELP THE TENNESSEE VALLEY REGION AND NATION, AND WE DON'T SHY AWAY FROM SAYING SO, MR. CHAIRMAN.

BUT WE WANT TO MAKE IT CLEAR, THAT WE'RE DOING SO MAINLY WITH OUR OWN RESOURCES. THE FEDERAL INVESTMENT IN TVA'S REGIONAL DEVELOPMENT PROGRAMS, ALTHOUGH CRUCIAL, DOES NOT

REPRESENT AN "UNFAIR" INVESTMENT IN THE REGION AND THAT INVESTMENT BY ITSELF CERTAINLY DOES NOT GIVE THE VALLEY REGION A FEDERALLY SPONSORED ADVANTAGE OVER ANY OTHER REGION.

IF THE VALLEY DOES HAVE AN ADVANTAGE, THAT ADVANTAGE COMES FROM ITS OWN RESOURCES AND THE RESOURCES OF ITS PEOPLE WHICH ARE ITS TRUE BUILDING BLOCKS FOR GROWTH AND PROGRESS.

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0729R

THE FOLLOWING QUESTIONS WERE SUBMITTED
TO TVA PRIOR TO THE HEARING.

1. Question: Please provide a description and funding level for each individual nonpower program, project, and grant initiative undertaken or continued during FY 83, FY 84, and FY 85.

Answer: A table which lists funding levels for all nonpower activities is attached. These funding levels include regular annual appropriations, supplemental appropriations such as the jobs bill (P.L. No. 98-8), and unobligated funds carried forward from prior years. Descriptions of these activities follow.

- A. Dam safety modifications includes capital modifications to various TVA dams to achieve consistency with the Federal Guidelines for Dam Safety.
- B. Additions and improvements includes capital additions and improvements to various navigation and multipurpose structures.
- C. Recreation facilities includes construction of recreation facilities at various dam reservoirs and reservations, and purchase of tributary stream access sites.
- D. LBL facilities includes purchase of equipment, and construction of and capital modification to various facilities at Land Between The Lakes.
- E. Local flood facilities includes studies, modifications, and relocation of structures and stream beds to mitigate potential flood damage on tributary streams, in conjunction with the community resources program. This program is being phased out.
- F. Chemical facilities includes the purchase of equipment and construction of research and development and/or support facilities for the national fertilizer development program.
- G. The ammonia-from-coal facility includes the construction of a facility to evaluate the feasibility of producing ammonia from coal.
- H. The north Alabama coal-to-methanol project includes the construction of a production facility to evaluate the feasibility of and to produce methanol from coal.
- I. General facilities includes purchase of equipment and construction of facilities in support of general service activities.
- J. Yellow Creek Port includes construction and development of port facilities at Yellow Creek at the northern terminus of the Tennessee-Tombigbee Waterway in Tishomingo County, Mississippi.

- K. Regional water management includes activities to monitor and improve the quality of surface and groundwater resources, including both point source and non-point-source pollution.
- L. Reservoir releases improvements includes efforts to increase the amount of dissolved oxygen in the water below dams.
- M. Fisheries resources includes activities to sustain and improve the quality of the Valley area fisheries.
- N. Navigation operations includes TVA activities in maintenance and operation supporting primary and secondary navigation channels and locks.
- O. Flood hazard analysis includes maintenance of a flood hazard data base and analysis of flood risk to assist in reservoir water control operations during flood conditions.
- P. Multipurpose reservoir operations activities include water control operations, control of obnoxious plants and mosquitoes, dam safety analysis, reservoir land planning, dam reservation operation and maintenance, reservoir land management, and maintenance of structures and equipment.
- Q. Forest resources includes assistance to develop Valley forests and forest management to increase forest productivity, create related jobs, strengthen the forest-based economy, and ensure an adequate supply of wood and forest products to meet future needs.
- R. Wildlife resources includes activities on TVA lands and, in conjunction with State and Federal wildlife agencies, activities to develop, stabilize, and enhance the Valley's wildlife resources.
- S. Recreation resources includes development and operation of recreational opportunities on TVA lands.
- T. Environmental/energy education activities are designed to develop a long-term awareness of environmental and resources issues important to Valley residents, and to create State-operated resource centers, in conjunction with various State universities, for environmental and basic education support to local school systems.
- U. Valley mapping and remote sensing includes maintaining and distributing topographic and other maps of the Valley region in conjunction with the U.S. Geological Survey, as well as remote sensing services based primarily on aerial photography.
- V. Conservation of public lands and waters activities include ensuring that TVA actions and the actions of others on TVA reservoirs are in compliance with applicable Executive

orders, State and Federal environmental regulations, such as the Endangered Species Act and the National Environmental Policy Act, and TVA statutory and policy requirements.

- W. Regional air quality management includes monitoring trends in ambient air quality, identifying air quality problems, and developing mitigation strategies in coordination with regulatory agencies.
- X. Land Between The Lakes is the Nation's only outdoor laboratory which combines recreation, environmental education, and land stewardship to demonstrate the benefits of multiuse management of public lands.
- Y. Acidic precipitation includes efforts to determine the causes, effects, and possible mitigation of acid precipitation.
- Z. Navigation development and engineering assistance includes assistance to States and local communities in evaluating and planning for river transportation facilities, such as river terminals and barge handling facilities.
- AA. Tennessee-Tombigbee Waterway includes assistance to States and local communities in regional and navigation development associated with the recently opened Waterway.
- AB. Economic development and analysis includes technical assistance to local communities in analyzing and solving increasingly complex development and investment decisions encountered by the communities while attempting to stimulate their economies.
- AC. Minority economic development includes technical and managerial assistance to existing and proposed business enterprises and development organizations operated by socially and economically disadvantaged persons.
- AD. Special opportunities counties and cities includes technical assistance and, in limited instances, financial assistance to communities and counties in the poorest Valley areas in projects to create jobs, enhance income levels, and develop local resources for self-sustained economic growth.
- AE. Industrial skills development includes assistance to Valley States, local governments, educational institutions, and other agencies, as well as business and industry, in developing and implementing training programs that produce a more skilled labor force capable of assuming jobs with incoming and expanding medium- and high-technology industries.
- AF. Floodplain management includes providing information and technical assistance to communities on tributary streams with potential flooding situations to help them achieve proper use of the floodplain while protecting existing developments.

- AG. Regional waste and water supply management includes assistance to local communities in improving the management and enhancing the efficiency of local solid waste, water supply, and wastewater disposal systems. It also includes a new effort to manage hazardous waste problems in the Valley region.
- AH. Townlift includes assistance to small and medium-sized communities to become more functional, efficient, and competitive in order to facilitate economic revitalization of their central business districts.
- AI. Community preparedness includes short-term technical assistance to communities in local leadership development, formation of strategies for economic growth, increasing involvement in the private sector in development activities, and improvement of essential community facilities and services.
- AJ. Agricultural resources development includes activities to help farmers increase productivity and income, demonstrate high-income enterprises on small farms, develop markets, conserve soil, evaluate and analyze current projects, and develop and demonstrate technologies for safe and economical use of agricultural wastes.
- AK. Fertilizer research and development is a national program to develop more efficient, lower cost fertilizers and environmentally safe manufacturing processes which consume less energy and nonrenewable resources, and to promote uses of fertilizers which maximize agricultural production and maintain environmental quality.
- AL. Fertilizer technology introduction includes packaging newly developed fertilizers and processes in prototype units and expediting the acceptance of the new technology to quickly transfer the benefit of the research and development to farmers and the industry on a national basis.
- AM. Ammonia-from-coal process includes the development and demonstration of the technology and economics of producing ammonia from abundant coal as opposed to more costly natural gas. This program is drawing to a successful conclusion and is being phased out.
- AN. Hardwood fuels research includes activities to advance the technology and improve the economy of producing ethanol from wood to encourage commercial production and replace petroleum fuels.
- AO. The national energy demonstration program was intended to develop and demonstrate energy conservation activities and alternate energy sources.
- AP. General service activities include routine maintenance of various facilities and reimbursable services furnished at the request and expense of other agencies.
- AQ. The jobs bill program (P.L. No. 98-8) included activities to create jobs for long-term unemployed persons by performing maintenance or constructing facilities on existing TVA reservations.

Summary of Capital Investment and Program Expenses
Financed from Appropriated Funds
(Obligations in thousands of dollars)

		1983	1984	1985
	Ref.	Budget	Budget	Budget
CAPITAL INVESTMENT				
New look at Pickwick Landing Dam.....		20,230	13,552	7,000
Columbia Dam and Reservoir.....		8,159	3,085	2,210
Dam safety modifications.....	A	-	-	5,000
Additions and improvements.....	B	3,846	3,528	4,688
Recreation facilities.....	C	100	198	223
Land Between The Lakes facilities.....	D	275	190	90
Local flood facilities.....	E	1,000	200	180
Chemical facilities.....	F	6,139	7,244	6,079
Ammonia-from-coal facility.....	G	2,236	183	316
North Alabama coal-to-methanol project.....	H	28,414	29,841	4,069
General facilities.....	I	2,886	2,533	2,893
Yellow Creek Port.....	J	<u>4,200</u>	<u>2,819</u>	<u>28</u>
Total capital investment.....		<u>77,485</u>	<u>63,373</u>	<u>32,776</u>
EXPENSES				
NATURAL RESOURCES				
Water resources:				
Regional water management.....	K	1,340	1,829	4,450
Reservoir releases improvements.....	L	-	1,099	1,117
Fisheries resources.....	M	<u>773</u>	<u>888</u>	<u>590</u>
Total water resources.....		<u>2,113</u>	<u>3,816</u>	<u>6,157</u>
Reservoir system operations:				
Navigation operations.....	N	1,410	1,832	1,548
Flood hazard analysis.....	O	479	528	545
Multipurpose reservoir operations.....	P	<u>18,821</u>	<u>19,882</u>	<u>19,582</u>
Total reservoir system operations.....		<u>20,710</u>	<u>22,242</u>	<u>21,675</u>
Land and forest resources:				
Forest resources.....	Q	1,660	1,839	2,335
Wildlife resources.....	R	750	1,031	1,084
Recreation resources.....	S	1,045	8,333	904
Environmental/energy education.....	T	<u>580</u>	<u>525</u>	<u>550</u>
Total land and forest resources.....		<u>4,035</u>	<u>11,728</u>	<u>4,873</u>

		1983	1984	1985
	Ref.	Budget	Budget	Budget
EXPENSES (Continued)				
NATURAL RESOURCES (Continued)				
Resource management and development support:				
Valley mapping and remote sensing.....	U	1,010	1,080	1,100
Conservation of public lands and waters.....	V	1,058	1,017	810
Regional air quality management.....	W	621	689	700
Total resource management and development support.....		2,689	2,786	2,610
Land Between The Lakes.....	X	6,267	6,790	7,160
Acidic precipitation assessment.....	Y	325	500	-
Total natural resources.....		36,139	47,862	42,475
ECONOMIC AND COMMUNITY RESOURCES				
Economic resources:				
Navigation development and engineering assistance.....	Z	935	1,050	1,116
Tennessee-Tombigbee Waterway.....	AA	-	-	1,500
Economic development and analysis.....	AB	3,271	3,740	3,677
Minority economic development.....	AC	977	935	1,287
Special opportunities counties and cities...	AD	2,184	2,275	5,687
Industrial skills development.....	AE	3,200	4,775	3,919
Total economic resources.....		10,567	12,775	17,186
Community resources				
Floodplain management.....	AF	1,500	1,955	1,775
Regional waste and water supply management.....	AG	-	1,338	1,635
Townlift.....	AH	1,100	800	874
Community preparedness.....	AI	2,515	1,452	1,275
Total community resources.....		5,115	5,545	5,559
Total economic and community resources.....		15,682	18,320	22,745
AGRICULTURAL RESOURCES DEVELOPMENT.....	AJ	4,927	5,963	5,821
NATIONAL FERTILIZER DEVELOPMENT				
Fertilizer research and development.....	AK	13,775	14,044	14,964
Fertilizer technology introduction.....	AL	11,840	12,381	13,169
Ammonia-from-coal process.....	AM	2,856	5,441	6,417
Hardwood fuels research.....	AN	3,790	4,793	4,060
Total national fertilizer development.....		32,261	36,659	38,610

		1983	1984	1985
	Ref.	Budget	Budget	Budget
EXPENSES (Continued)				
NATIONAL ENERGY DEMONSTRATIONS.....	AO	<u>-425</u>	<u>517</u>	<u>-</u>
GENERAL SERVICES.....	AP	<u>970</u>	<u>627</u>	<u>875</u>
Expiration of rescission (Section 2901, P.L. 98-369).....		<u>-</u>	<u>-</u>	<u>1,538</u>
Total expenses.....		<u>89,553</u>	<u>109,948</u>	<u>112,063</u>
Jobs bill (P.L. 98-8).....	AQ	<u>13,180</u>	<u>26,820</u>	<u>14</u>
Total appropriations.....		<u>180,219</u>	<u>200,141</u>	<u>144,854</u>

2. Question: Please list TVA's appropriated budgets for the past 15 fiscal years (FY 70-FY 84). Also please list and describe for each of these fiscal years any program, project, or grant initiative undertaken or performed costing over \$100,000.

Answer: The attached table shows the annual appropriations converted to 1970 dollars. For ease of analysis, we have plotted both the actual appropriations and the constant dollar equivalent on the attached chart. The increase during the last 1970s is attributable to the construction of several water resource development projects, and the 1980-1981 spikes are attributable to the north Alabama Coal Gasification project. Both the water resource projects and the gasification project have been essentially completed, and appropriations levels in 1984 have returned to the 1970 level. Descriptions of selected programs follow.

Operations

The water resources development program consists of regional water management and operation of the reservoir system. Specific activities include water quality analysis and mitigation, reservoir releases improvements, fisheries resource development, navigation operation, flood hazard analysis, water control operations, reservoir ecology, dam safety analysis, reservoir land planning and management, dam reservation operation and maintenance, and maintenance of the dam structures and associated facilities and equipment.

Through 1976 general resources development program was the term used to describe regional developmental activities that included land management, forestry, air quality, wildlife, recreation, and economic and community resources. Starting in 1977 this was divided into two programs—the natural resources development program and the community resources development program.

In 1977 and 1978 the natural resources development program included all management enhancement activities involving land, forestry, air, wildlife, and recreation resources. Beginning with 1979 this was divided into the land and forest resources development program and the resource management and development support program.

The land and forest resources development program includes all activities to develop the Valley's forest, wildlife, and recreation resources. This includes efforts to improve forest quality and capacity in an environmentally acceptable manner, preserve and improve wildlife, provide access to recreation resources, and conduct environmental/energy education.

Activities included in the resource management and development support program are Valley mapping and remote sensing, regional air monitoring and management, and conservation of public lands and waters.

In 1977 and 1978 the community resources development program included all developmental activities involving economic and community resources. Beginning in 1979 this was divided into two programs--the economic resources program and the community resources program.

Activities in the economic resources program include increasing commercial navigational development of the river system, assistance to local communities in investigation and analysis of economic problems, assistance in the development of minority economic enterprises, special assistance to the poorest areas in the Valley in job creation and income enhancement, and assistance to local and State governments and education facilities in skills development.

Activities in the community resources program include assistance to local communities in formation of strategies and technical skills necessary for future growth; assistance to small and medium-sized communities in making themselves more functional, efficient, and competitive; demonstration of advanced solid waste and water supply management practices; and assistance to communities and individuals in planning proper use of the floodplain.

Land Between The Lakes is the Nation's only outdoor laboratory which combines recreation, environmental education, and land stewardship to demonstrate the benefits of multiuse management of public lands.

Activities in the national fertilizer development program include developing better fertilizers, creating more efficient ways to manufacture them, finding ways to use them more efficiently, making new technology available to the agricultural community, and improving the efficiency of the fertilizer industry.

The agricultural resources development program includes activities to help farmers develop systems to increase productivity and income, demonstrations of high-income enterprises on small farms, assistance in market development, assistance with soil conservation, evaluation and analysis of current projects, and the development and demonstration of technologies for safe and economical use of agricultural wastes.

The national energy demonstration program was intended to develop and demonstrate energy conservation activities and alternate energy sources.

General service activities include routine maintenance of various facilities and reimbursable services furnished at the request and expense of other agencies.

The jobs bill program (P.L. No. 98-8) included activities to create jobs for long-term unemployed persons by performing maintenance or constructing facilities on existing TVA reservations.

Capital

Water resources development activities include investigations for future facilities; construction of the following multipurpose dams: Duck River project (Normandy and Columbia Dams prior to 1973), Normandy, Columbia, Mills River, Tellico, and Tims Ford; construction of the Upper French Broad and Bear Creek multipurpose water control systems; construction of a new lock at Pickwick Landing Dam; and additions and improvements at various multipurpose facilities.

Flood control facilities activities include construction of various flood control facilities, such as the South Chickamauga project and additions and improvements at existing flood control facilities.

The economic development program consisted of construction of additional facilities at Yellow Creek Port in 1983.

Local flood damage facilities activities include modification and relocation of structures and stream beds to mitigate potential flood damage along tributary streams, in conjunction with the community resources program.

Recreation facilities includes construction of recreation facilities as a part of the land and forest resources development program.

Lower Elk Town activities included the purchase of land and assistance in constructing a rural area development program.

Land Between The Lakes activities include the purchase of equipment and construction of and capital modification to various facilities at Land Between The Lakes.

Through 1978 fertilizer and chemical facilities included the purchase of equipment and construction of facilities for the national fertilizer development program. This included some funding for the ammonia-from-coal project in 1978.

Starting in 1979 chemical facilities included the purchase of equipment and construction of facilities for the national fertilizer development program.

The ammonia-from-coal facility includes the construction of a facility to evaluate the feasibility of producing ammonia from coal.

National energy demonstrations included the purchase of equipment for the national energy demonstrations program.

General facilities includes purchase of equipment and construction of facilities in support of the general service activities.

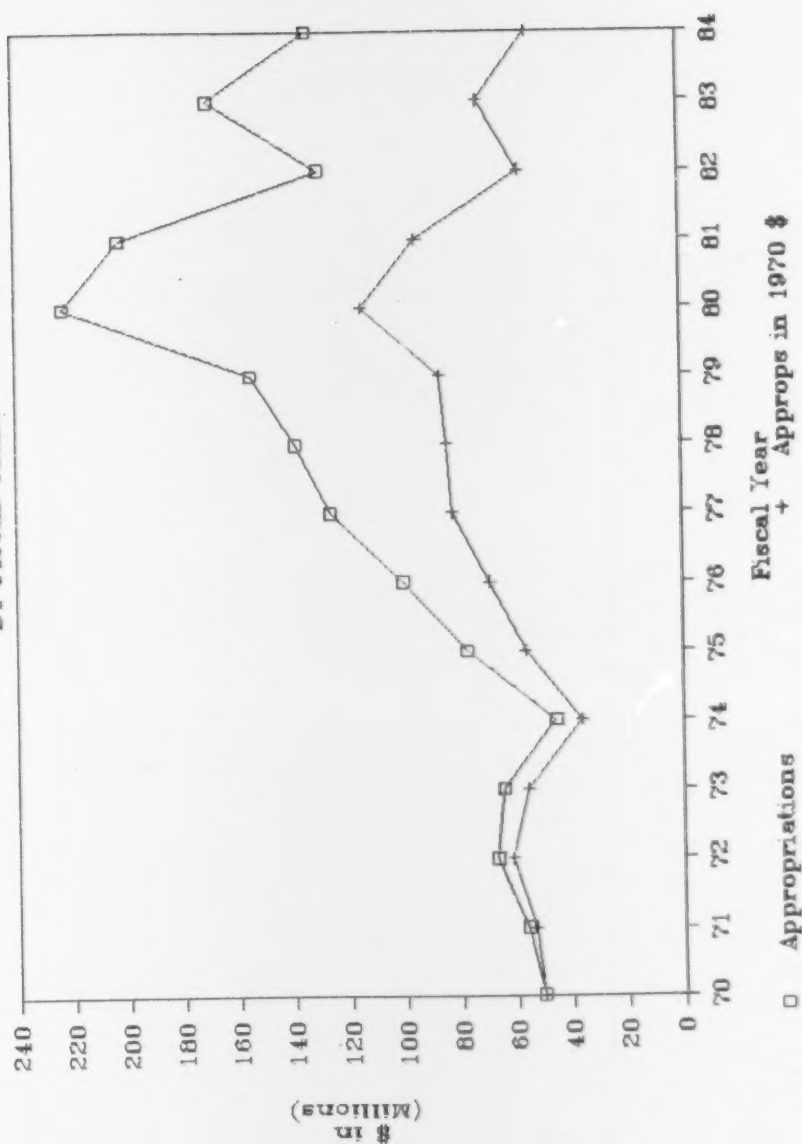
Jobs bill (P.L. No. 98-8) includes capital expenditures and construction of facilities as provided for by the jobs bill program.

CAPITAL (Continued)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Upper French Broad WACS.	400	2,000	1,700												
Hill River Dam.....								2,500	7,300	20,000	25,000	30,940	22,015	22,970	21,000
Pickwick lock.....	1,000	1,400	3,000	3,000		5,445	10,645	12,049	17,608	7,479					
Bear Creek WACS.....	4,422	4,897	8,000	11,250		16,900	23,742	9,700	11,500	1,846	19,353				
Telllico Dam.....	8,275	6,223	3,822	1,504											
Texas Ford Dam.....															
Additions and															
improvements.....	325	332	400	500		440	700	1,002	1,608	4,849	2,100	1,092	1,840	2,836	3,015
Navigation facilities:															
RR bridge--Decatur, AL					250	275	2,000	3,600	2,455						
Yellow Creek Port.....	450	800	1,250	3,504											
Additions and															
improvements.....	30	325	650	550	350	203	600	150	386						
Flood control facilities		365	900	-	900	400									
South Chickamauga Creek							750	250	5,700	1,362					
Additions and															
improvements.....	1,276			-		901		250						4,200	
Economic development....															
Local flood damage															
facilities.....	176	182	226	309	600	87	800	200	891	1,980	1,020	663	1,750	700	610
Recreation facilities...							1,000	1,000	803	988	1,000	624	600	100	100
Lower Elk Town.....							2,035	550	2,700						
Land Between The Lakes..	1,500	1,900	2,000	1,448	2,898	2,041			1,833	4,500	2,900	1,897	1,426	215	190
Fertilizer and chemical															
facilities.....	4,818	7,520	5,720	3,100	2,426	2,959	1,187	1,000	20,900	4,776	6,383	7,329	7,324	5,215	6,827
Chemical facilities.....															
Asbestos-from-coal															
facilities.....										10,971	11,204	1,620			
National energy															
demonstrations.....											55,000	150,000			
General facilities.....	2,642	-336	-895	-325	2,500		837	102	1,933	2,893	3,220	2,926	1,853	4,990	3,013
Slippage.....	-1,500														
Jobs bill (P.L. 93-9)...														24,551	
Total capital.....	25,665	29,155	34,366	29,936	9,976	41,900	62,060	21,438	72,626	80,859	135,680	215,091	36,808	67,777	34,755

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
General reduction,															
slippage.....										-4,550					
Rescission.....											-555	-85,500			
Unallocated.....															
Total														47,271	-47,271
appropriations..	50,600	56,180	67,150	64,550	45,676	77,400	100,025	30,550	125,930	138,510	154,531	222,475	202,063	129,162	169,162
Total appropriations in															
1970 dollars.....	50,600	53,546	61,442	55,825	36,310	56,296	69,178	82,304	84,266	86,534	113,978	94,765	57,120	71,725	53,759

TVA ACTUAL APPROPRIATIONS BY FISCAL YEARS



3. Question: Please trace the historical development and funding of TVA's various nonpower programs such as clean air, clean water, economic development, soil erosion control, etc.

Answer: All of TVA's programs--power and nonpower--have evolved over the years in response to changing needs in the Valley and the Nation. TVA's commitment to economic growth through integrated resource development recognizes that natural resources are interrelated, that what is done with one resource often affects other resources, and that mankind's progress is inextricably linked to wise use of those resources. Through this period TVA has also made available what it has learned in the Tennessee Valley to other areas across the country and, in some cases, overseas. TVA's role as a living laboratory for integrated resource development and its use of demonstrations to transfer this knowledge to others is a constant theme throughout TVA's first half-century. The paragraphs below and the attached table trace this evolution over the 52 years of TVA's existence.

The 1930s

During TVA's beginning decade the region's most pressing needs were harnessing the Tennessee River to regulate disastrous floods and put the water to work for the people of the Valley; restoring the land to a less erosive and more productive, stable ecological state; and finding ways to overcome the devastating poverty of the region, particularly in rural areas. TVA tackled these problems through multipurpose reservoir construction--which provided much-needed jobs and training opportunities for Valley workers--and through efforts to upgrade farming, forestry, and other natural resource management practices. These efforts were complementary and laid the foundation for the integrated resource development approach which has been a TVA hallmark for over 50 years.

In addressing the Valley's needs, TVA early in its life adopted the concept of demonstrations as a means of using small amounts of money to provide leadership, stimulus, and guidance to a larger population than otherwise would be the case. In agriculture, for example, facilities that had been built at Muscle Shoals, Alabama, during World War I to produce nitrates for explosives were assigned to TVA for research, development, and introduction of fertilizers and fertilizer materials, including cooperative work with extension agents and farmers to test the practical use of new fertilizers. The Muscle Shoals facility also produced phosphate fertilizers that were used throughout the region to establish pastures on steep lands. This development helped stimulate the development of a livestock industry and encouraged farmers to move row crops from hillsides to more level land. In cooperation with land-grant universities, TVA began to

establish farm demonstrations throughout the Nation to show others the value of soil conservation and fertilizer use. Demonstrations of fertilizer use, soil conservation measures, and other improved farming techniques helped increase farm incomes while preventing siltation of new reservoirs. From the outset, these efforts were conducted in collaboration with extension agents, the U. S. Department of Agriculture, and State land grant institutions.

The demonstration strategy also was central to TVA's work in forestry and fisheries management during this period. Reforestation and fire prevention measures were needed in the Valley to increase the quality and economic value of the region's woodlands while, at the same time, reducing soil erosion and reservoir siltation and improving water quality. TVA established two tree nurseries to supply seedlings and helped organize State and county fire protection programs. It also worked with landowners to educate them on the benefits of reforestation and fire control and demonstrated planting techniques. All these efforts were eventually taken over by State agencies which TVA helped create. In fisheries, TVA established a fish hatchery and conducted pioneering research on reservoir fisheries. This research and practical management experience on the newly formed lakes soon changed many concepts about how best to manage man-made reservoirs for optimum fish production. Again, the States assumed the ongoing responsibility for reservoir fisheries management.

Similarly, in the area of recreation development, TVA used demonstrations to draw attention to the fact that there would be great public demand for recreation facilities on the region's new lakes and that that demand could be capitalized to boost the Valley's economy. TVA set up a few demonstration parks in connection with reservations around its dams. It operated these facilities itself for a time, not to make them a permanent part of TVA's operations but to suggest, both to private citizens and public agencies, what could be done. These parks were soon transferred to the States and formed the nucleus of what has eventually evolved into excellent State park systems.

More examples could be given, ranging from demonstrations in community planning and development (the city of Norris) to far-sighted highway design (Norris Freeway). The philosophy underlying all of these activities, however, was the same: TVA's role was not to develop some sort of grand "master plan" for the region, but was to use practical demonstrations to encourage the scores of agencies and other institutions of the Valley to plan and implement their own programs for meeting the region's needs. This operating philosophy has been carried forward to the present day.

The 1940s

The war years of the early 1940s saw TVA accelerate its dam construction to help meet the Nation's need for energy for wartime production. The massive amount of electricity produced by those new hydroelectric facilities was used by the region's growing aluminum industry to manufacture aluminum for war planes and by the secret "Manhattan Project" in Oak Ridge, Tennessee, where the atomic bomb was being developed. At the same time, the advanced mapping techniques TVA had developed to support its activities were put to use to support military and intelligence mapping requirements, and TVA's fertilizer development facilities at Muscle Shoals, Alabama, were pressed into service for manufacturing chemicals and munitions for the armed forces.

After World War II the Valley still needed flood control and better natural resource and conservation practices, but improvements were evident and new needs were emerging. With the completion of Kentucky Dam and reservoir, year-round commercial barge navigation along the 650-mile waterway from Paducah, Kentucky, to Knoxville, Tennessee, was a reality. This, in turn, led TVA to intensify its efforts to assist the economic development activities of the States and local governments of the region. Demand for outdoor recreation also began to increase after the war, and TVA continued its efforts worked to establish State park systems in the region. TVA technical assistance also was instrumental in the creation of State departments for forest, fish, and wildlife management, as well as State and local planning boards. TVA's efforts to improve agricultural practices and fertilizer use continued, in conjunction with the work of the USDA, the State Extension Services and the State agricultural departments.

The 1950s

A major need of the region during the 1950s was more electricity to meet the burgeoning demand brought on by postwar economic growth, and by national defense preparations of the "Cold War" era. While TVA's dams and new coal-fired plants met the demand for electricity, TVA also worked to meet the need for technical assistance that paralleled the potential for industrial development. And the region's continuing need for flood control measures was driven home in 1957 by the longest rainstorm in the Valley's history; TVA was able to reduce the flood crest at Chattanooga by nearly 22 feet and avert \$112 million in damages. Meanwhile, TVA developed a prototype program of local floodplain management for communities where flood control is impractical, and recommended a national program to Congress based on the Tennessee Valley experience in this effort.

In the late 1950s controversy over TVA appropriations--including the issue of capital funds for coal-burning plants--produced budget cutbacks that limited TVA's nonpower activities in regional development. This controversy eventually led to the legislation

in 1959 which made the TVA power system completely self-financing, obtaining its funds only from its revenues and proceeds from bonds backed solely by those revenues. The Self-Financing Amendment also required the power system to make an annual payment to the U. S. Treasury toward paying back the earlier taxpayer investment in the power system plus another annual payment as a return on that investment. The latter payment is based on current interest rates. This left only the nonpower activities dependent on Federal appropriations.

The 1960s

This decade saw the region's economic progress bear fruit through the end of the tide of outmigration which had plagued the area for so long. No longer were the region's young people forced to look for work outside the Valley. TVA's commitment to economic development through integrated resource management centered on tributary areas--those portions of the region along the Tennessee River's tributary streams which were still being held back because of local obstacles to economic advancement.

Through its tributary area development program, TVA initiated a variety of technical assistance activities aimed at helping local areas help themselves and develop greater community self-reliance. Assistance was developed for community-initiated efforts to inventory their resources and determine how to use them most effectively. Adult education and job training programs were initiated. Technical help was provided on the location and design of industrial sites and the infrastructure of roads and utilities needed to service those sites.

TVA's efforts in local floodplain management were intensified during this decade: Communities received help in identifying flood zones and in drawing up plans and local ordinances to restrict development in those zones. The floodplain management program focused more on using floodplains for such flood-compatible purposes as recreation than upon building structures to control flooding. This work proved so successful that it served as a model for a Nation-wide program administered by the Corps of Engineers.

During this period, TVA also initiated two nationally significant efforts--Land Between The Lakes and strip mine reclamation--to demonstrate how marginal lands could be reclaimed for productive uses. Land Between The Lakes resulted from a TVA Board proposal to President Kennedy that the area of land between TVA's lower Kentucky Reservoir and the Corps of Engineers' Lake Barkley be established as a national recreation area to show how a large area of abused and marginal land could be restored to productivity for purposes of outdoor recreation, environmental education, forest and wildlife management, and economic development. President Kennedy referred the proposal to the Department of the Interior which, after nearly two years of study, recommended that

TVA's demonstration role placed it in a better position than any other agency to implement such a comprehensive multipurpose project.

In the area of mine reclamation, TVA established demonstrations in strip mine reclamation methods and urged passage of effective State reclamation laws. The States were slow to act, and in 1965 TVA began including in its contracts a requirement that mine operators supplying strip-mined coal to TVA reclaim and revegetate the stripped area. TVA's leadership was instrumental in the eventual establishment of Federal and State reclamation programs.

The 1970s

These years began a period of transition in the region which, in many respects, was a microcosm of trends at work throughout the Nation. During the seventies, TVA and the Nation recognized that difficult and costly measures were necessary to protect the quality of the environment. TVA initially installed electrostatic precipitators to control particles emitted from its coal-fired steam plants. As air quality standards became stricter, TVA entered into a consent decree for a plant-by-plant air quality control plan utilizing low-sulfur coal, limestone scrubbers, and other measures. TVA also initiated leading-edge research on ways to improve water quality--primarily dissolved oxygen content--below dams. Mine reclamation efforts were stepped up to include "orphan lands" which had been abandoned before reclamation laws went into effect.

TVA's completion of Tellico Dam was symbolic of another TVA transition: ending the era of large dam construction which had been such a significant part of TVA's work since the 1930s. TVA has not proposed a new reservoir project since 1969. However, one partly completed dam from that era--Columbia-- is still an unresolved issue pending the outcome of efforts to preserve another endangered species, the birdwing pearl mussel, and an updated benefit-cost study.

In addition to TVA's long-standing activities in flood control, navigation, water resources, reservoir management, and agricultural and fertilizer R&D, a variety of other programs received special attention during the seventies as TVA responded to changing needs in natural resource and community development. The recreation program began working to provide improved reservoir access as well as assured public access to the region's scenic streams. A regionwide environmental/energy education program was initiated in cooperation with area universities. New forestry initiatives included efforts to tap low-grade wood supplies for energy purposes. An increase in soil erosion in the region, brought on by more cultivation of row crops, prompted cooperative efforts with USDA, the Extension Service, and State departments

of agriculture to again control the loss of this valuable resource. Community assistance activities included advice on solid waste management--including energy from wastes--and improved health care in rural areas.

This decade saw an increased awareness of energy issues that peaked with the oil crisis. Alone among Federal agencies, TVA had the staff capability and the operating experience to help seek solutions to national and regional energy needs.

In essence, TVA served as the Nation's applied energy laboratory, exploring and testing innovations in a host of energy areas. For example, utilizing a combination of its power and nonpower resources, TVA developed a national pilot-plant demonstration of the atmospheric fluidized-bed combustion of coal for power production. This is a promising technology for reducing air pollution without using costly chemical scrubbers, and if successful, it would permit use of the region's vast resources of high-sulfur coal. TVA also undertook such energy demonstration projects as fuel cells, electric vehicles, waste heat utilization, solar energy, coal gasification, and the Nation's largest energy conservation program. These programs were funded with both appropriated and power system funds. Today TVA continues to invest approximately 2 percent of its power system revenues in research and development activities. Recent budget cuts have eliminated all appropriated funds from TVA's energy R&D program.

The 1980s

As the decade of the eighties began, TVA reassessed its mission and priorities in the light of the current needs of the Valley and the Nation. This reassessment--accomplished with the help of citizens throughout the region and with outside experts--led TVA to rededicate itself to the concept which gave rise to its birth in the 1930s: demonstrating innovative solutions to difficult problems in energy, natural resource management, fertilizer and agricultural development, and renewable-resource-based economic and community development. Thus, TVA's emphasis is still on finding creative solutions to problems which stand in the way of making the region and the Nation a better place to live.

Through work with existing industries, for example, TVA is helping small firms improve the efficiency of their operations so that they can reduce their costs and even expand and create new job opportunities. Work with forest industries is helping them find new domestic and international markets for the region's abundant forest resources--forests which have made a marked recovery since the 1930s. Efforts are underway to help State and local governments and the region's industries find ways to handle hazardous wastes so that future industrial development in the area will not be constrained. And work continues on developing new fertilizer products, controlling soil erosion, and finding other ways to improve agriculture in the Valley and the Nation.

Along with assistance to others, TVA is placing strong emphasis on excellence in managing the resources for which it is directly responsible. A reservoir lands planning program is involving the general public, public officials, business and industry interests, and others in planning for the best use of TVA-owned lands along the waterway. Dam safety modifications are underway to ensure that all TVA dams are safe in accordance with current guidelines. Long-range cyclic maintenance plans are being developed and implemented for all of TVA's facilities. Improved corporate planning, budgeting, and financial management systems have been put in place to make TVA's internal administration even more effective.

* * *

So the needs and issues of the region and the country have evolved over the past 50 years, and TVA's priorities and programs have changed with them. But TVA continues its basic emphasis on helping this region become a strong asset to the Nation as a whole. TVA also continues its commitment to demonstrate down-to-earth solutions to resource conservation and development problems that can be applied nationally. As a statement issued by the Board of Directors asserts, "The unique opportunity afforded TVA in the 1980's is the chance to show how energy sufficiency, economic vitality, harmony with the environment, and social opportunity can flourish together, not as competing goals but as essential ingredients to enhance the quality of life in the Tennessee Valley. No other region . . . has a comparable opportunity."

TVA Appropriations for Nonpower Activities

1935-1985
(Obligations in thousands of dollars)

	<u>Expenses</u>	<u>Capital</u>	<u>Total</u>	<u>Constant 1935 Dollars</u>
1935	2,300	10,800 ^a	13,100	13,100
1940	4,600	30,400 ^a	35,000	31,677
1945	6,600	22,100 ^a	28,700	19,911
1950	6,400	16,100 ^a	22,500	11,048
1955	5,500	1,900	7,400	3,198
1960	7,900	8,200	16,100	6,163
1965	14,600	35,200	49,800	17,613
1970	24,900	25,800	50,700	14,601
1975	31,800	42,100	73,900	15,451
1980	87,300	73,000	160,300	23,629
1985 (est.)	112,100	32,800	144,900	16,426

a. Capital investment figures also include power generating component costs of multipurpose dams. All single-purpose power generating costs are excluded.

4. Question: Please list any existing TVA nonpower programs which will be phased-out in the future. Also list and describe any new programs which you intend to begin in the future.

Answer: As our response to question 3 illustrates, TVA has worked over the years through a consistent core of resource-oriented programs. The relative size of these programs increase or diminish in response to the priority of problems facing the region at any particular time. TVA's responsiveness is keyed to its flexibility in applying its expertise and resources. As a consequence, no change is foreseen in the scope of core programs TVA employs in its work. However, evolution of activities within those programs will remain critical in retaining program effectiveness.

Natural resource activities will continue TVA's interest with Valley water quantity and water quality. However, present activities already reflect a transition in progress. TVA has been working to see that Valley States have water quality management plans reflecting State responsibilities on TVA reservoirs. As that work progresses toward completion, TVA is already exploring nonpoint pollution in the Valley that lie outside existing State/Federal regulations or remedy. Groundwater supplies not only the needs of many municipal and private users but contributes almost 50 percent of the water flow of the reservoir system. The consequences of current and potential pollution and depletion of this resource are very real to TVA. While TVA is not the only interested party, TVA has responsibilities in defining and addressing this problem.

TVA is phasing out its waste heat aquaculture studies. These have proven technically feasible in conjunction with large sources such as TVA coal-fired power plants but commercialization has not yet been feasible.

Wildlife restoration programs are intentionally designed to phase out TVA's role in the course of these long-term commitments. Current initiatives include bald eagle, osprey, and river otter restoration.

TVA is about 50 percent complete in initiating development of a network of 17 self-sustaining centers for environmental and energy education in conjunction with regional universities. Five centers have already progressed to the point that no further TVA funds are provided (Murray State University, Murray, Kentucky; Memphis State University, Memphis, Tennessee; The University of Tennessee at Chattanooga, Chattanooga, Tennessee; Middle Tennessee State University, Murfreesboro, Tennessee; and Western Carolina University, Cullowhee, North Carolina). While substantial progress has been made toward the original objective of these centers as training and resource centers in support of local school systems, the centers' successes have prompted an added dimension. The accomplishment of growth and change in the

Valley economy is still highly dependent upon critical educational skills such as math, science, and computer literacy. TVA will initiate a program that will provide direct services to schools via the university network and through special demonstrations. The program will include the development of a computer curriculum and instructional library, focusing on environmental and energy themes which will be available to Valley educators.

The Valley region has some of the larger concentrations of hazardous waste generators in the country. The threat the lack of adequate treatment of these materials poses to air and water quality and as well as future economic growth is a mutual concern of TVA and the Valley States. TVA has been instrumental in the establishment of an independent waste exchange cooperative between Valley industry. TVA has avoided the temptation to prematurely interject itself and its expertise into the problem with a predetermined agenda and solutions. Effective management of the problem in TVA's opinion will hinge on the active and willing participation of all affected groups of the Valley. Regulation and technology alone are not sufficient tools. TVA is taking the time, through public forums and discussions with appropriate State and Federal officials, to resolve the most effective and proper role to play. A final determination to this question will not be reached until 1986.

Research and development in agricultural programs also reflects evolution. Activities on the application of municipal sewage sludges to agricultural land will be phased out after 1986. Demonstration programs in six communities have been held over the last three years, aided by laboratory and field data accumulated since 1971. Private use of TVA's demonstration techniques has already occurred, and TVA data has been utilized in Federal and regional guidelines for agricultural use of sludges.

New research is being initiated to determine the types of fertilizer materials best suited to injection into irrigation systems, an efficient means of application not widely used today. Project results will help fertilizer technologists develop more appropriate materials for use in these systems.

Two major areas of future fertilizer R&D work are nitrogen and phosphate. Nitrogen is the most costly fertilizer element and its production is highly energy intensive. About 50 percent of the nitrogen applied is lost to the atmosphere through a process called nitrification or is washed away by surface water runoff, which contributes to nonpoint pollution. A large part of TVA's future R&D efforts will be channeled toward reducing this nitrogen loss by (1) developing fertilizers which have inherent properties that increase nitrogen use efficiency by growing plants, and (2) by development of inhibitors that can be incorporated in fertilizers to control reactions in soil and water. Reduction of applied nitrogen losses will (1) reduce the industries' energy requirements and operating costs, (2) lower costs to farmers, (3) increase crop yields, and (4) reduce pollution of surface and ground waters.

All of the phosphate contained in fertilizers is obtained from phosphate ore (rock). Supplies of high-grade ore in the United States are nearing depletion and the vast reserves of lower grade ore are beginning to be mined. These lower grade phosphate ores present many problems to the fertilizer industry, including (1) decreasing process efficiency, (2) decreasing product grades, and (3) increasing amounts of offgrade and by-product materials to be handled. TVA's R&D efforts will be directed toward (1) new and more efficient methods of beneficiating (upgrading) phosphate ores, (2) development of new production processes for utilizing lower grade ores and intermediates made from them, and (3) use of phosphate ore without an intermediate processing step. Potential benefits are over \$1.5 billion annually by avoiding importation of high-grade ores.

Most of the phosphate rock is processed into a fertilizer intermediate, wet-process phosphoric acid. Considerable R&D effort will be directed toward improving the process by (1) decreasing energy requirements, (2) increasing recovery of phosphate fed to the process, (3) increasing acid concentration as produced, and (4) improving handling and disposal of by-products.

R&D efforts will also be directed toward (1) development of new fertilizer granulation processes with emphasis on energy conservation, pollution control, and process control, and (2) improved fluid fertilizer processes with emphasis on higher concentration and improved storage properties.

Plans are to design and construct a new fertilizer granulation test facility for the continued study of various granulation processes. This unit will replace the existing facility which is over 30 years old and is not compatible with today's energy-efficient technology. This work is expected to start in 1986 and be completed in 1987.

Plans are also being made for a phosphate ore beneficiation test facility to be completed in 1987. This will be an extension of our ongoing research and development activities to develop viable processes for processing lower grade phosphate ores.

5. Question: Please provide the Subcommittee with an organizational chart showing the various TVA management levels and program divisions.

Answer: The chart is attached.

6. Question: In testimony before the Environment and Public Works Committee in 1981, Director Bob Clement recommended that TVA reduce the number of "assistants, assistant to's, and staff positions." He cited figures showing an increasing number of managerial personnel per employee and stated that payrolls should more accurately reflect workload. Using a uniform set of assumptions and job definitions, please chronicle the proportion of managerial positions per employee from 1965 to the present. Please exclude Division of Construction figures and describe the assumptions and definitions used in your answer. In addition, please detail trends in salary increases for managerial vs. non-managerial personnel for this same period.

Answer: During the time he was a Director, Director Bob Clement had an assistant. None of the current Directors have an assistant. The following table shows trends in salary increases for managerial versus nonmanagerial personnel from 1965 through 1984. Due to the pay cap in Section 3 of the TVA Act, which acts as a limit only on management salaries, and because of the ability of TVA to more quickly adjust its management salaries to market, TVA's salary increases for managers have been lower overall than for nonmanagers. From 1968 nonmanagement salaries increased more than 18 percent over management salaries.

6

TVA SALARY
PERCENTAGE INCREASES
1965 - 1984

	<u>Management</u>	<u>Nonmanagement</u> ¹
1965	NA	3.4%
1966	NA	3.9
1967	NA	5.7
1968	6.7%	6.0
1969	6.5	7.2
1970	7.7	9.2
1971	6.1	7.4
1972	5.5	5.5
1973	5.3	5.6
1974	6.7	8.3
1975	7.1	7.9
1976	7.2	7.1
1977	5.7	6.0
1978	5.1	6.4
1979	8.6	8.5
1980	7.8	8.3
1981	7.5	6.9
1982	5.8	5.4
1983	5.3	3.8
1984	0.0	2.0

-
1. Includes occupational classifications for professionals, technicians, administrative and clerical support, guards, janitors, annual operating and maintenance, hourly operating and maintenance, and construction workers.

In the last several years TVA has made a concerted effort to contract out more work and to use contractors' employees (job shoppers) for engineering and other work that had in the past been done in-house. Thus, the level of management employees to in-house workforce has risen. Footnotes to the following table explain other specific events which have affected the ratio.

TVA Nonconstruction Management with Supervisory
Responsibility as a Percent of
Nonconstruction Employment

<u>Date</u> ¹	<u>Percent</u> ²
12/67 ³	4.70
12/68	7.33
12/69	8.10
12/70	7.44
12/71	7.44
12/72	7.48
12/73	7.79
12/74	7.28
12/75	7.22
12/76	7.33
12/77	6.82
12/78	7.04
12/79 ^{4,5}	8.47
12/80 ⁶	9.29
12/81	9.57
12/82	10.55
12/83	10.24
12/84	10.91
4/85	10.77

1. Information is not available for 1965 and 1966.
2. Employees are placed on the M schedule because they have supervisory responsibility, or their duties would place them in a conflict situation with represented employees, or other reasons that make it inappropriate for them to be in represented positions. All employees of TVA are represented by unions except for M schedule and P (physician) schedule.

TVA established a supervisory responsibility indicator in each employee record in 1982. Percentages for 12/67 through 12/81 have been adjusted on the basis of the average percent of M-schedule employees having supervisory responsibility on 12/82, 12/83, 12/84, and 4/85.

3. M schedule not established until 1968; management employment equivalent to current M-5 through M-13 grades.
4. Major reorganization creating additional offices and divisions, thus creating additional managerial positions for the organizations and organization levels.
5. Approximately 265 power plant operators transferred to M schedule.
6. Approximately 20 auditors transferred to M schedule.

7. Question: Does TVA do all of its own construction and service work, or is some portion of it contracted out? If some work is contracted for, please detail what types of work have been, any trends over the years in the proportion of in-house vs. contracted out work, and contracts and their costs since 1980.

Answer: No, TVA does not do all of its construction and service work. The contracted out construction and service work primarily consists of construction activities for new generating plants, transmission and communication facilities, and additions and improvements at existing generating plants, which includes major safety modifications at the Browns Ferry and Sequoyah Nuclear Plants now in service. In addition, contractual work includes activities such as rehabilitations and modifications of turbines, boilers, and auxiliaries; installations and modifications of precipitators, tall stacks, and cooling towers; sulfur dioxide scrubber installations; coal washing facilities; navigation lock wall posttensioning; dredging; and bridgework. The amount of contract work varies from year to year depending upon the construction projects in progress. In 1980 TVA construction expenditures were \$2,020.9 million, with the contracted-out amount being \$707.3 million or 35.0 percent. For 1984, construction expenditures were \$1,030.0 million, with the contracted out amount being \$194.2 million or 18.8 percent.

The following table shows a breakdown of construction expenditures, amount contracted, and contracted percent for fiscal years 1980 through 1984.

COMPARISON OF CONTRACTED AMOUNT WITH CAPITAL EXPENDITURES FOR
POWER PLANT CONSTRUCTION

(Dollars in Millions)

	1980			1981		
	Expenditures Before Interest Charges	Amount Contracted*	Contracted Percent	Expenditures Before Interest Charges	Amount Contracted*	Contracted Percent
<u>Power Generation Plants</u>						
Browns Ferry Nuclear Plant.....						
Sequoyah Nuclear Plant...	133.1	11.4		108.5	11.8	
Watts Bar Nuclear Plant..	128.1	8.7		167.6	10.7	
Bellefonte Nuclear Plant.	203.7	38.0		215.3	30.8	
Deferred and canceled nuclear plants.....	1,003.9	475.0		995.2	435.2	
Cumberland Steam Plant...						
Raccoon Mountain Pumped- Storage Plant.....	5.4	-		7.3	0.9	
Subtotal.....	1,474.2	533.1	36.2	1,493.9	489.4	32.8
All other**.....	546.7	174.2	31.9	588.9	153.1	26.0
Total.....	2,020.9	707.3	35.0	2,082.8	642.5	30.8

*Includes furnish and install contracts, engineered equipment contracts, and engineering services contracts.

**Includes some appropriations capital expenditures.

COMPARISON OF CONTRACTED AMOUNT WITH CAPITAL EXPENDITURES FOR
POWER PLANT CONSTRUCTION

(Dollars in Millions)

	1982		1983	
	Expenditures Before Interest Charges	Amount * Contracted Percent	Expenditures Before Interest Charges	Amount * Contracted Percent
<u>Power Generation Plants</u>				
Browns Ferry Nuclear Plant.....				
Sequoyah Nuclear Plant...	70.9	18.8	46.7	0.5
Watts Bar Nuclear Plant..	223.4	17.1	280.1	27.3
Bellefonte Nuclear Plant.	240.9	31.3	217.6	18.9
Deferred and canceled nuclear plants.....	573.9	251.0	67.9	29.5
Cumberland Steam Plant...				
Raccoon Mountain Pumped- Storage Plant.....				
Subtotal.....	1,009.1	318.2	612.3	76.2
All other**.....	631.8	151.6	463.0	111.0
Total.....	1,640.9	469.8	1,075.3	187.2

*Includes furnish and install contracts, engineered equipment contracts, and engineering services contracts.

**Includes some appropriations capital expenditures.

COMPARISON OF CONTRACTED AMOUNT WITH CAPITAL EXPENDITURES FOR
POWER PLANT CONSTRUCTION
(In millions of dollars)

<u>Power Generation Plants</u>	1984		
	Expenditures Before Interest*	Amount Contracted	Percent Contracted
Watts Bar Nuclear Plant....	289.5	23.0	
Bellefonte Nuclear Plant...	206.5	47.6	
Deferred and canceled nuclear plants.....	<u>8.0</u>	<u>9.4</u>	
Subtotal.....	504.0	80.0	15.9
All other**.....	<u>526.0</u>	<u>114.1</u>	21.7
Total.....	<u>1,030.0</u>	<u>194.1</u>	18.8

*Includes furnish and install contracts, engineered equipment contracts, and engineering services contracts.

**Includes transmission and communication facilities, general power facilities, additions and improvements at existing generating plants (including modifications for nuclear generating plants) and some appropriations capital expenditures.

8. Question: How large is TVA's present construction work force? Please detail past trends and future anticipated trends in terms of absolute numbers and proportion of total TVA employees.

Answer: As of April 30, 1985, TVA's construction work force was 7,571. The construction work force has varied considerably from year to year, depending upon the construction projects in progress. The construction work force peaked during 1980 with over 24,000 employees when TVA had 14 nuclear generating plant units and some major environmental projects under construction. Today, four units remain under construction and the construction work force has been reduced drastically. The following table shows a comparison of construction work force to total TVA employment by fiscal years 1975 through 1986. All data is actual or estimated as of September 30 of each fiscal year.

<u>Fiscal Year</u>	<u>Total TVA Employment</u>	<u>Construction Work Force</u>	<u>Percent</u>
1975	28,242	12,545	44.4
1976	32,140	14,713	45.8
1977	37,947	17,755	46.8
1978	47,154	24,089	51.1
1979	49,941	24,504	49.1
1980	51,709	24,287	47.0
1981	50,094	20,824	41.6
1982	39,899	13,352	33.5
1983	37,181	10,571	28.4
1984	33,588	7,708	22.9
1985 (est.)	33,000	6,353	19.3
1986 (est.)	32,000	4,405	13.8

9. Question: 1. Please describe in detail TVA's internal systems for controlling project and procurement costs and administrative inefficiencies and materials waste. Please give some examples of how they work.

Answer: TVA defines and establishes responsibility for project and procurement costs, and to control administrative inefficiencies and materials waste. The Board of Directors approves written codes, consistent with the authority granted the Board by the TVA Act, to convey policy determinations in specific areas of significance. These codes are supplemented by written procedures to assure that resources are used consistent with applicable laws, regulations, and policies. These procedures further provide for safeguarding against waste, fraud, and abuse. Accounting, budget, and financial management information systems are in place which assure that reliable data are obtained, maintained, reported to management, and fairly disclosed in published financial statements. Through these codes, procedures, and financial systems responsibility is established and managers are held accountable for their performance.

The following information is provided to respond in more detail to the specific points raised in the question.

Controlling Project Costs: TVA has developed a capital budgeting system to initiate, approve, and monitor capital projects. Projects are proposed by management after an extensive analysis of the factors which influence the use of capital, including projected incremental cash flows, internal rates of return, improvements in productivity, and other indicators of economic feasibility. All proposals must include analyses of alternatives and environmental impacts. The investment proposal is reviewed and approved or disapproved by the Board if the total project cost is more than \$1,000,000 or if the project is of a novel or unusual nature. Projects with a total cost of less than \$1,000,000 may be approved by the responsible office manager within the budget system previously considered and approved by the Board.

Program managers are responsible for managing approved projects, including allocation of project funds to performing organizations and monitoring and controlling obligations, expenditures, and performance. Approved budgets and actual obligations and expenditures are maintained and reported to the program manager on a monthly basis. The Board and the General Manager review the status of approved capital projects at least quarterly as a part of the regular performance reporting system. Additionally, a report is issued quarterly showing approved budgets and schedules for new and revised projects.

TVA uses contractors for capital project work when cost analyses show it is cost effective to do so. A recent illustration involves the Eull Run Steam Plant. After performing the required

analyses, it was determined that the old precipitators at Bull Run would have to be removed and new ductwork installed. This project was approved by the Board in the capital budget process. The responsible TVA organization solicited bids from outside contractors as well as a proposal from TVA's Office of Construction. By using an outside contractor, TVA was able to save significant amounts.

Controlling Procurement Costs: TVA's Division of Purchasing formulates, recommends, administers, and evaluates the procurement, transfer, shipment, and disposal of TVA's equipment, materials, supplies, and service needs. TVA uses purchasing agents to coordinate and manage its purchases. These agents specialize in specific areas and maintain a working knowledge of regulations, business and industry conditions, technological advances, administrative policies and restrictions, and user interests in their areas of specializations. These agents maintain an awareness of the quality, costs, and urgency of need of items requested by TVA organizations. They also coordinate quality, delivery, and performance with outside contractors.

The authority to approve purchase requisitions, procurement contracts, and payments for items and services purchased is delegated to specified TVA managers, supervisors, and other individuals. Restrictions to that authority are based on dollar amounts, the nature of the items obtained, and the organizational responsibility of the approving individuals. Significant contract changes require the same levels of approval. Various systems monitor expenditures compared to authorized contract amounts.

All purchases and contracts for supplies or services (except personal services) are normally made after advertising. Contracts are awarded to the lowest responsive bidders, with bid evaluation and award procedures rigidly specified and controlled. Progress payments and advanced cash management techniques are utilized wherever feasible to minimize the cost of capital included in contractor bids and to maintain control of the contract, especially in large cost-reimbursement contracts. In instances of progress payments, services, and highly technical items, contract administrators are required to assess and approve contractor work prior to TVA's payment.

TVA uses engineers and other technicians as appropriate for preaward evaluations of contract bids. These employees may also be called on to evaluate the quality and technical compliance of items received before payments are made to contractors. TVA conducts preaward audits of contractor proposals and reserves the right to conduct financial and compliance audits of contractor records to help determine the extent of contractor compliance. Management and supervisory reviews of monthly ledger sheets, cost analysis worksheets, and other reports offer additional opportunities to detect and investigate questionable procurement practices.

Controlling Administrative Inefficiencies: The TVA Act places the ultimate responsibility on the Board of Directors. The Board conveys major administrative policy throughout the Authority by the use of written codes. These codes are supplemented by various administrative, accounting, and personnel procedures that define responsibility and promote resource use that is consistent with applicable laws, regulations, policies, and program objectives. These procedures further provide for safeguarding resources against waste, fraud, and abuse. The plan of organization, which is a part of the policy code, delegates authority and responsibilities along organizational lines for projects, programs, and activities. Individual job descriptions define the limits of authority and responsibility for each employee. These policies and procedures definitively fix responsibility.

TVA has a well-defined mechanism for establishing, updating, and monitoring its goals. A multiyear planning process is used to develop specific program direction and to establish long-term corporate and office-level goals and objectives. Using this direction the offices prepare the capital budget and their annual operating plans.

Operating plans are used to generate budgets at all organizational levels (section, branch, division, office) and by projects, programs, and objects of expenditure that are entered into a computerized budgeting information system. On a monthly basis, costs incurred are captured at the same levels as budgeted by a responsibility reporting system which provides managers a comparison of actual costs with budgets. Significant variances are explained by the responsible managers to management and the Board in performance reports and meetings.

TVA's Office of Audit and Evaluation performs internal and contract audits to determine compliance with policies, procedures, and accounting principles; adequacy of controls in all internal systems and processes; and compliance by contractors with provisions in contracts with TVA. In addition, the office evaluates TVA's various programs and activities to determine their effectiveness. Audit reports and program evaluation reports are directed to responsible managers with copies to the Board.

In addition to the systems and processes described above, TVA is audited annually by a nationally recognized CPA firm. The firm expresses an opinion on the financial statements taken as a whole, the adequacy of internal controls, and TVA's compliance with applicable laws.

Controlling Materials Waste: TVA uses many different methods to minimize materials waste, including management awareness of the necessity to carefully control all segments of operating costs. In the early 1970s fuel costs began a ten-fold increase, interest rates started to climb to unprecedented levels, and inflation pushed operating and materials costs to record highs. In response, operating managers placed even greater emphasis on inventory management and the reduction of materials waste, two

areas that could be controlled internally to counter the effects of uncontrollable external pressures.

One management tool developed by TVA is an inventory management system that incorporates automatic reorder points and common item identification codes for inventories in all power plant store-rooms and field warehouses throughout TVA. This computer-based system allows immediate location of needed items already in stock somewhere in the power system, thereby avoiding emergency purchases (often at higher prices than could be obtained through normal procurement procedures), duplicate orders, and attendant possible overstocking. TVA warehousing procedures also provide for periodic reviews to identify obsolete or unusable materials which can then be expeditiously disposed of to maximize TVA's recovery on such items.

Materials determined to be surplus to TVA's needs at one location are first advertised throughout TVA for possible use elsewhere and then may be sold outside TVA on a competitive-bid basis. TVA's recent cancellation of construction on eight nuclear generating units created a surplus of many highly technical and specialized materials and plant components for which there is no ready market. In addition to working with other Federal agencies to try and find other markets for these items, TVA has created an investment recovery team to identify, advertise, and promote domestic sales of the surplus items. TVA was also an active participant in the formation of an industry organization to pool expensive spare parts for nuclear generating facilities. The key benefit of this program is that it permits power producers to interchange spare parts and thereby avoid unnecessary duplication of inventories. TVA anticipates that over the life of the program TVA will save millions of dollars in inventory costs and power losses by participating in these pooling arrangements.

Improved maintenance standards are also employed to minimize materials waste. These standards are used to plan the acquisition of appropriate quantities of materials on an economical and timely basis. When feasible, TVA obtains materials and equipment which have been declared surplus by other Federal agencies. Items such as helicopters, instrumentation, vehicles, and scrap steel plating have been modified and utilized throughout TVA, resulting in significant savings.

TVA has been successful in reducing vehicle maintenance and fuel costs associated with employee travel between major TVA office locations (Chattanooga and Knoxville, Tennessee, and Muscle Shoals, Alabama) by implementing daily bus service and by encouraging employees to ride together when traveling to the same location. These efforts have proven to have other advantages (such as safety) in addition to actual savings in fleet operations costs.

Question: 2. Do you believe these systems adequately protect the taxpayer's investment? Are improvements being made?

Answer: Yes. TVA's corporate arrangements to prevent, detect, and respond to fraud, waste, and abuse are adequate to protect the taxpayers' and the ratepayers' investments and have proven their effectiveness in doing so. The systems provide for high ethical standards, strong internal controls, good planning, approval, accountability, and monetary controls. Improvements in this area have been made in recent years, and TVA is committed to making any additional changes which might be necessary to maintain its sound record. The attachment sets out the details of these various systems, the results TVA has achieved using them, and the improvements which have been made.

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ATTACHMENT

TVA'S CORPORATE ARRANGEMENTS TO PREVENT, DETECT, AND RESPOND TO FRAUD, WASTE, AND ABUSE HAVE PROVEN THEIR EFFECTIVENESS

- A. Office of the General Counsel
- B. Audit Review Group
- C. Office of Audit and Evaluation and TVA's Internal Control System

APPENDIX

*Too extensive
for printed
hearing
record*

- 1. The Office of the General Counsel's Procedures for Investigating Waste, Fraud, and Abuse and TVA's Conduct Standards
- 2. Employee Protection Material
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ATTACHMENT

TVA'S CORPORATE ARRANGEMENTS TO PREVENT, DETECT,
AND RESPOND TO FRAUD, WASTE, AND ABUSE
HAVE PROVEN THEIR EFFECTIVENESS

The effectiveness of the arrangements TVA has for dealing with allegations of fraud against TVA is persuasive evidence that the traditional inspector general model followed by other agencies under the Inspector General Act of 1978 (Act) does not fit TVA. That Act, which does not apply to TVA, created an Office of the Inspector General in 12 departments and agencies. The President, in a December 13, 1978 memorandum, a copy of which is attached, referred to the Act and said that he was "directing that the significant features of the Inspector General program be extended throughout the Federal Government." The memorandum states that the purpose of extending the Inspector General program is to eliminate waste, fraud, and error.

The essence of the memorandum is that agencies should provide for a plan to extend the elimination of waste, fraud, and error by (1) analysis of resources devoted to that effort together with (2) a planned approach to using the agency's audit and investigative resources in an effort to deal with waste, fraud, and error. It leaves to each agency the flexibility of applying its resources to those issues. TVA has used that flexibility to good advantage.

The Board's arrangements to prevent, detect, and respond to allegations of fraud, waste, and abuse are designed to fit TVA's particular corporate structure. Different from agencies' structures, the TVA Board which exercises all the "powers of the corporation" 16 U.S.C. Section 831a(g) (1982), is a full-time Board that acts in both policymaking and operating manager roles. The Board is responsible for the management of both TVA's appropriated programs and its power programs, each of which is to be run with the efficiency and economy of a private business. The Board actively supports and regularly demonstrates its serious interest in TVA's conduct regulations, ethical standards, and their application to all employees. Accordingly, when a fraud occurs, TVA managers know how to respond and take thorough and decisive action against all involved.

TVA has taken strict disciplinary action in cases involving employees' relatively small gifts from contractors, uses of TVA cars and telephones for other than official purposes, falsification of time records, and like instances. It appears, however, that had similar facts occurred in the private sector the improper conduct may have been viewed as insubstantial or even ignored. In the last few months, news reports have been full of stories about Government contractors intentionally engaged in serious acts to substantially defraud the United States, including the following:

1. General Dynamics Corporation's Chairman and Chief Executive Officer announced his retirement in the wake of General Dynamics being charged with improper Government billings, including up to \$244 million on military contracts. There are also charges that General Dynamics intentionally underestimated the time and labor needed to build 18 nuclear-powered submarines.

2. The General Electric Corporation pleaded guilty in Federal court to charges that it defrauded the Government by illegally claiming more than \$800,000 in cost overruns on missile contracts. A former GE manager testified that he directed employees to make illegal claims, and he that forged time cards.
3. Documents submitted in a case involving Westinghouse Electric Corporation apparently show that cash vouchers were routinely falsified to create a slush fund for company picnics. It is also alleged that Westinghouse employees routinely submitted false travel vouchers and other false documents, the cost of which was eventually passed on to the Government.
4. Otis Elevator Co. and one of its executives have been indicted on three counts of overcharging the Government on a \$25 million consulting contract.
5. The Defense Contract Audit Agency has identified General Dynamics Corp.; Newport News Shipbuilding and Dry Dock Co.; Textron, Inc.; McDonnell Douglas Corp.; Rockwell International; and Boeing Corp. as submitting questionable claims, including payments for country club fees under various defense contracts.

The widespread evidence of such conduct by large companies and their officers and employees, including several with whom TVA does business, is some indication that this is not isolated conduct but a pattern of behavior which is now accepted or at least not viewed as serious misbehavior in private industry.

Perhaps all of this can be summarized by a recent quote from Industry Week, where it was said:

Time theft--the deliberate and persistent abuse of paid work time--costs U.S. business \$150 billion a year Last year . . . 320 top executives polled estimated that employees "steal" an average of four hours and 22 minutes a week by getting to work late, leaving early, making personal phone calls, socializing, reading, and doing personal business on company time. Some examples:

- A Texas company where workers made more than 10,000 long-distance phone calls over a period of several months to listen to erotic recorded messages.
- A Houston printing firm where a woman sold insurance on company time.
- A Boston financial-services firm where a \$40,000-a-year employee spent four hours a day during the football season placing and recording bets.
- A Denver company where an employee took daily on-the-job naps in the storage room.

With the emphasis on contracting out Government work, the issue of the relative standards of conduct demanded of contractors and their employees needs to be examined. While there are realizable benefits to the Government contracting with private companies for goods and services, the benefits are too quickly

lost if the contractor's code of business conduct allows, condones, or ignores improper charges to the Government's accounts or other acts in conflict with the Government's interests.

In sharp contrast to the standards that have been demonstrated in the private sector, TVA's effort to prevent, detect, and respond to waste, fraud, and abuse involves a program that covers all areas of employee ethics and conduct (including, among others, receipt of gifts, financial disclosure, political activity, and criminal activity) as well as an extensive set of internal controls and a comprehensive internal and external audit program. Details of these program elements are set out in A, B, and C of this attachment.

THE WHITE HOUSE
WASHINGTON

December 13, 1973

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

SUBJECT: Steps to Eliminate Waste, Fraud, and Error in
Government Programs

The resources of this government must be managed well, free of waste, fraud and inefficiency. The American people believe, and I agree, that managing their tax money is public trust. That is why I approved a law establishing Offices of Inspector General in twelve major department and agencies. Today, I am directing that significant features of the Inspector General program be extended throughout the Federal Government. Eliminating waste, fraud, and error should be as important to you as your program objectives.

First, by January 31, each of you should develop for my review a comprehensive plan setting the course for your agency in this overall effort. You should immediately designate a single official, accountable directly to you, to oversee preparation of the plan and to monitor its implementation for you. The plan should include at a minimum:

- An analysis of all resources now devoted to the audit and investigation functions and the capacity of your department or agency to prevent and deal with problems of waste, fraud and error.
- Your planned approach to using your agency's audit and investigation resources in a concerted effort to deal with issues of waste, fraud and error, especially in those programs and activities you deem most vulnerable.

Second, I expect each of you personally to review and respond to major allegations by the Comptroller General and others of waste, fraud or error.

Third, I would like each of you to submit to me your suggestions on government-wide action I can take to reduce waste, fraud and error.

Fourth, I am assigning the Director of the Office of Management and Budget responsibility for overseeing this program to eliminate fraud and waste for me. He will provide additional guidance as appropriate. He will be responsible for keeping me informed of progress under the program and activities of Inspectors General and their counterparts in the agencies.

Fifth, I have asked the Attorney General to prepare an action plan to assure that investigations by Inspectors General and similar officers are coordinated with other investigative and prosecutorial activities.

Finally, I am directing the Chairman of the Civil Service Commission (or, following its establishment, the Director of the Office of Personnel Management), working with the Attorney General and the Secretary of the Treasury, to improve the training of investigative and audit staffs throughout the Executive Branch.

Jimmy Carter

A. OFFICE OF THE GENERAL COUNSEL

1. Procedures for Investigating Allegations of Employee Misconduct

TVA's Board of Directors has publicly stated that it takes allegations of fraud, corruption, and abuse seriously and that each allegation will be fully investigated. TVA employees act on these obligations responsibly and feel confident about reporting fraud, waste, and mismanagement within TVA.

The heads of TVA offices and divisions, as a part of their normal administrative responsibilities, are responsible for the detection and prevention of employee misconduct within their organizations. TVA's General Counsel is responsible for investigating or directing investigations of all alleged violations of law or regulations, or gross waste of resources, from whatever source received, including reports from TVA management and employees and referrals from the General Accounting Office, calls received on the Office of the General Counsel's "hotline" or from TVA's Citizen Action Line.

Among the allegations reported by TVA management was one in which a TVA payroll clerk falsified his time reports to add numerous hours of overtime. The TVA manager responsible for reviewing the time reports questioned the overtime and through an investigation directed by the General Counsel the clerk was found to have been paid thousands of dollars for his false overtime. The appropriate United States attorney was informed of this fraud, the clerk was prosecuted, and he is currently in prison.

In another example, management reported to the Office of the General Counsel allegations about the apparent misadministration of a TVA contract for waste disposal at a TVA construction site.

Based on the investigation, breaches of TVA's internal controls were found which resulted in payments to the contractor for waste disposal service not actually performed, and an oral modification of the contract entered into by several TVA managers contrary to TVA procedures that all contracts and contract changes must be in writing. In that case a TVA administrator acted outside established procedures in trying to resolve a contract dispute arising from the oral modification and poor administration of the contract. A manager and an employee were demoted as a result of their involvement in the mismanagement of this contract.

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1. Since that hotline has been in existence, TVA has been referred only 41 of the total calls received by the GAO Hotline for the entire Government. We believe it is some measure of the confidence the public and TVA employees have in the integrity of TVA's investigation process that so few callers have felt the need to call GAO with their allegations. The GAO Fraud Hotline is well publicized in the region. Except for one GAO referral we are investigating, we have investigated and responded to each GAO referral referred to TVA.

Each allegation received by TVA's General Counsel, including anonymous complaints, is recorded and a file is permanently maintained on it. This procedure is followed for allegations that involve TVA employees as well as those about contractors or others related to TVA. All allegations received are fully considered and all allegations which are not anonymous are investigated.

Anonymous allegations have the recognized potential to be used in a vicious way by slandering or libeling a public employee with intentionally baseless charges. On the other hand, anonymous complaints can effectively identify serious problems. To balance these considerations, when an anonymous allegation is received by TVA, the totality of the circumstances on the face of the complaint are reviewed and the General Counsel's office makes a practical, common sense determination on whether there is a fair probability that if thoroughly investigated, misconduct will be found. Of particular value in making this determination is whether relevant facts of the anonymous allegation can be corroborated. The anonymous allegation, therefore, must include sufficient specific facts on how the misconduct, fraud, or abuse occurred or there must be other sufficient bases to determine that the allegation may be credible.

The Office of the General Counsel determines the nature and extent of the investigation to be made on each allegation and conducts or directs the investigation, making use of the personnel and facilities of the Office of Audit and Evaluation, the Public Safety Service, and other TVA offices and divisions as desirable. If at any time in the investigation the Office of the General Counsel determines that initial or additional corrective or disciplinary action could be warranted on the facts available, it advises the appropriate management of its determination. Appropriate management then takes such corrective or disciplinary action as, in its judgment, is warranted by the facts available.

When there is evidence of a violation of Federal criminal law, that information is referred immediately by the General Counsel to the Department of Justice.² In those cases, the General Counsel consults with the Department of Justice before conducting further TVA investigation or recommending disciplinary or other adverse employee action. If it is a matter of a State criminal violation, the appropriate State or local law enforcement authorities are informed.

When the Office of the General Counsel conducts an investigation, it prepares a draft report outlining the method of investigation used and the facts ascertained. Before the report is released to TVA management, each employee charged with improper conduct is given an opportunity to review the report and the evidence on which it is based. The employee is given five days to review the draft report and to respond to it either orally or in writing. This response (or a summary of oral comments) is made part of the investigative report.

2. Under the Civil Service Reform Act of 1978 (5 U.S.C. Section 1206(3) (1982), TVA refers to the Special Counsel of the Merit Systems Protection Board for appropriate action all allegations of political activity by TVA employees in violation of the Hatch Act.

The General Counsel normally makes his report to the head of the employee's office or division, with a copy to the General Manager for the General Manager's and Board's independent review. In some cases the General Counsel may determine that the facts warrant that the report should be made directly to the General Manager.³ The General Counsel's final report specifies any mandatory action required by law, Executive orders, or Federal regulations and contains any recommendations for administrative action which the General Counsel views as legally supportable. Management, not the General Counsel, is responsible for determining what specific disciplinary action is taken based on the report and for informing the General Counsel of the action taken on the report. The General Counsel does not close his file until management has reported on the action taken and follow-up action is initiated by the General Counsel as necessary to assure that each case is handled to conclusion.

Between 1981 and 1984, the Office of the General Counsel completed 1,072 investigations of alleged employee misconduct. As a result of those investigations, the General Counsel advised TVA management that some range of disciplinary action could be supported against 269 employees; 87 employees were terminated, 70 were suspended, and others were demoted, warned, reprimanded, or otherwise penalized. (Table I sets out details on these investigations for 1981 through 1984, including source of complaint, types of misconduct, and the disciplinary actions taken as a result of these investigations.)

Additional Procedures

- A. The Office of the General Counsel's Procedures for Referring and Following Up on Allegations of Misconduct and Factors Considered in Assigning Priorities to Investigations.

The Office of the General Counsel considers certain factors in determining which allegations can be referred to other offices for investigation at the General Counsel's direction; assigning schedule priorities to investigations; and determining the appropriate level of resources to be devoted to each. The following factors are not exclusive and the General Counsel makes necessary determinations based on the following and other identifiable factors.

1. Employee Classification: Because management employees are responsible for seeing that TVA's internal control system functions, for supervising other employees, and for setting an example to other employees, allegations against management schedule employees are considered ahead of allegations against other employees. Also, allegations involving nonmanagement supervisors are considered ahead of others. For the same reason, allegations against higher grade employees in the same schedule are considered first.
 2. Office: Because the General Manager's office is responsible for providing overall direction to TVA and its integrity cannot be jeopardized, allegations against employees in the Office of the General Manager are investigated ahead of other allegations so that unfounded allegations can be laid
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3. In TVA the General Manager and the General Counsel report directly to the TVA Board and the General Counsel can handle conduct matters directly with the Board as he might deem warranted. The Manager of Audit and Evaluation also can report on his responsibility directly to the Board.

to rest and action can be promptly taken on allegations that are found to be substantiated. Because the Office of the General Counsel is responsible for handling investigations of alleged misconduct in other offices, misconduct by Office of the General Counsel employees cannot be tolerated. Therefore, allegations against employees in the Office of the General Counsel are given priority. Because of the sensitive nature of the work performed by employees in operating nuclear plants, the potential effect misconduct investigations may have on their job performance, and the need to prevent injury to employees or the public or damage to TVA property, allegations of misconduct at the Division of Nuclear Power's operating nuclear plants are given priority.

3. **Fraud and Waste:** Because of the need to control costs at all levels, allegations involving fraud or waste by TVA employees are investigated ahead of other allegations of misconduct involving items that may not include monetary loss to TVA. Similarly, allegations involving larger dollar amounts are investigated ahead of allegations involving lesser amounts. For the same reason, allegations which involve continuing fraud and waste are investigated ahead of those which involve a situation that is no longer occurring.
4. **As appropriate in carrying out its responsibilities for investigating employee misconduct,** the Office of the General Counsel asks TVA's Office of Audit and Evaluation to report on those facts which can be efficiently gathered through audit procedures including but not limited to reviews of (1) contracts, (2) TVA's internal control procedures, and (3) leave and travel records.
5. **Dangerous Conditions:** Because of the need to prevent injury to employees or the public or damage to TVA property, allegations of misconduct that involve possible injury to persons or damage to property are given priority.
6. **Number of Employees:** Investigations involving larger numbers of employees are given priority over investigations involving fewer employees.
7. **Source of Complaint:** Generally, anonymous complaints have proved marginally less reliable than complaints made by named individuals. Absent other indications, nonanonymous complaints are given priority over anonymous complaints.
8. **Publicity:** Because of the need to maintain TVA's credibility by laying unsubstantiated allegations to rest or by acting to correct allegations that are proven, allegations made publicly are given priority. Similarly, allegations made or referred by public officials are handled ahead of other allegations.
9. **Follow-Up:** When the Office of the General Counsel finds evidence of employee misconduct and recommends to appropriate management a range of disciplinary action, consistent with that recommended in the past for the same or similar offenses, the Office of the General Counsel requests to be informed by management of the disciplinary action taken. If during periodic reviews it is found that appropriate management has not reported on the action taken, a follow-up memorandum is sent to that office asking for that report.

10. In accordance with 28 U.S.C. Section 535, the Office of the General Counsel promptly reports to the United States Attorney or the Federal Bureau of Investigation any information, allegation, or complaint relating to violations of Title 18 which might involve Government officers and employees.

B. Conduct and Ethics Counseling

A central element of TVA's program on fraud, waste, and abuse is prevention. It is our strong belief that most employees want to act properly and within applicable requirements if those requirements are effectively communicated and if employees have the opportunity and are encouraged to ask questions and receive responsible, consistent counseling about their individual situations. Thus TVA's ethics program focuses on the areas of education, individual counseling, and systematic review of the outside financial holdings and outside employment of employees.

In TVA, the Designated Agency Ethics Official under the Ethics in Government Act is the General Counsel. Thus, review of ethical and conduct questions on proposed activities are reviewed by the same lawyers to the same standards as are the facts found in investigations of alleged misconduct. This unity of effort in prevention as well as response to fraud or misconduct allegations is one of the strengths of the program.

The Office of Government Ethics (OGE) performed a complete review of TVA's ethics program in 1981 and again in the spring of 1985. On both occasions, OGE commented very favorably on TVA's ethics program and on the strength of the Board's and the agency's commitment to it.

Ethics education is accomplished through a broad range of TVA-wide efforts, including memorandums, payroll inserts, and articles in TVA's widely read employee newspaper. In addition, specific educational programs are developed to meet particular needs that are identified.

For example, a number of years ago when TVA's energy conservation program was rapidly expanding, TVA hired a large number of relatively inexperienced persons whom it trained to perform energy audits in consumers' homes and to inspect and approve work performed by private insulation and weatherization contractors. It soon became clear that the unique duties and relative inexperience of these employees were leading to numerous complaints on a broad range of issues, including favoritism, sexual harassment, and misuse of TVA vehicles. In response, TVA developed and implemented an aggressive ethics training program specifically geared to the situations faced by these employees. This program resulted in a dramatic decrease in complaints. Other parts of TVA have similarly developed education programs to address particular issues of importance to their work.

In addition to education, TVA has a network of personnel officers in each of its offices or divisions trained to answer the more routine ethics questions and help employees with their individual situations. Unusual or difficult questions are referred to TVA attorneys in the Office the General Counsel. Where possible, employees are advised in very specific terms, including suggestions of appropriate limits on their activities to keep violations of TVA's conduct regulations from arising.

To make its ethics counseling more systematic and to prevent conduct violations from occurring, TVA requires prior management approval of all outside employment by annual employees. An employee's proposed outside activities are reviewed by at least two levels of management and must generally be approved by a manager at the level of a division director or above. Each employee whose outside activity is approved must be individually counseled on the provisions of the conduct regulations that may be applicable to his or her situation and on any limits on those activities. For example, an employee who wished to sell real estate during the employees' off-hours may be cautioned against using TVA time, telephones, and other TVA resources in connection with this outside work and be told not to sell to other TVA employees.

Finally, TVA receives and reviews financial reports filed by a substantial number of its managers. Under the Ethics in Government Act of 1978, TVA's executive-level managers (grade M-8 and above) file public Financial Disclosure Reports which are systematically reviewed to identify any actual or potential violation of TVA's conduct regulations or applicable law. For example, the financial holdings of a filer are reviewed against a list of current TVA contractors and against the employee's job description to see if any apparent violation may have or could occur.

The TVA Board has determined, by regulation, that stock interests that do not exceed \$5,000 in value and are less than 1 percent of the market value of all outstanding shares of the corporation are too remote or inconsequential to affect the integrity of an employee's services to TVA. This recognizes the unlikelihood that the actions a TVA employee could take on TVA's behalf could substantially affect a financial interest of that small size. This policy also improves the operation of TVA's ethics program by permitting TVA to focus its attention on the substantial interests that have the potential of actually affecting TVA's program or the public's confidence in it. This policy also has positive effects in dealing with our employees, who recognize that TVA directs its ethics program toward significant rather than inconsequential matters.

In situations where potential conflicts of interest are identified, employees are individually counseled, in writing, about the applicable legal requirements, and are instructed to be mindful of these requirements in acting for TVA. In some cases where actual, though usually inadvertent, conflicts have been identified, managers are counseled on resolving those conflicts. For example, through the financial disclosure system it was discovered that a TVA manager who administers a substantial contract with an engineering company also had an interest in a retirement plan at that firm resulting from his previous employment with that firm. It was determined that this could result in at least a technical violation of applicable financial interests laws. However, upon review it was determined that due to the nature of this pension interest, it was not possible for it to be affected by the employee's TVA actions. Accordingly, the TVA Board determined that the interest was not substantial enough to affect the integrity of the employee's services to TVA, thereby excluding the interest from the coverage of the financial interests law (18 U.S.C. Section 208).

Similarly, TVA requires Confidential Statements of Employment and Financial Interests to be filed pursuant to Executive Order No. 11222 by a large number of its midlevel managers (grades M-5 through M-7). These reports also receive a careful review (both at the division level and centrally) to detect any

actual or potential conflicts of interest, and in appropriate situations employees are counseled about their interests. TVA proposed some time ago to broaden the coverage of this confidential reporting requirement to include employees at additional grade levels so that the filing requirement will more closely reflect actual job duties and risks of unidentified financial interests. We are waiting on OGE's approval of the proposed regulations necessary to implement this improvement in TVA's ethics program.

TVA is proud of its ethics program and is constantly working to improve it, to assist our employees in keeping fully informed of TVA's conduct requirements, and in acting in accordance with them.

TVA's Office of the General Counsel also advises employees and TVA management on questions involving interpretation of TVA's conduct regulations or other applicable conduct-related laws. This includes giving written or oral advice on the applicability of:

1. TVA conduct regulations
2. Federal conflict of interest and other criminal laws
3. Statutory restrictions on post-employment activities
4. The Hatch Act
5. 31 U.S.C.A. Sections 1344 and 1349 (1983), limiting the use of Government vehicles to official purposes only

Each TVA employee at appointment is provided a copy of TVA's Employee Conduct Standards and Responsibilities. At various times throughout the year, such as near the holiday season when contractors are most likely to be proffering gifts to employees, TVA gives its employees with their paychecks information on TVA's conduct regulations. In addition, memorandums from TVA's General Manager, the General Counsel, or heads of offices on the conduct regulations are circulated to employees or posted on bulletin boards.

TVA's newspaper, Inside TVA, frequently features articles on TVA's conduct regulations and what penalties employees may expect if they are found to have violated the regulations. TVA's Office of Construction issues to its employees a booklet on conduct guidelines. In addition, TVA has provided employees a booklet on the proper use of TVA vehicles.

2. Employee Protection

For several years an annual trades and labor employee raised with his supervisors and others, including State and Federal agencies, various health- and safety-related allegations of improper disposal of polychlorinated biphenyls (PCBs). This employee was subsequently reduced in force for the stated reason that there was insufficient full-time work available for the crew in which he worked. Among other allegations resulting from this reduction in force, TVA's Office of the General Counsel investigated the allegation that the reduction in force was retaliation against this employee for responsibly raising health and safety issues on PCBs.

TVA actively encourages its employees to raise such issues and does not tolerate acts of reprisal taken against employees who responsibly report health and safety, nuclear safety, or matters involving waste, fraud, and abuse. Many of TVA's employees are members of various recognized professions (engineers, scientists, certified public accountants, attorneys, and physicians) and as such TVA expects that these managers and employees will think and act in full recognition of their professional obligations. In our view systems and programs designed to protect the employment status of a professional cannot completely prevent unlawful, unsafe, or improper activity. Also of importance in preventing such activity is the ethical standards of the professional engaged in any work for TVA. Such ethical behavior exists as a higher duty, quite independent of any duty to an employer or any employment protecting laws. The view that a professional needs protection against adverse employment consequences for fulfilling this higher duty may be seen as detracting from the profession. These professional standards are an additional basis of employees giving the employer information about wrongdoing and other matters.

TVA enforces its employee responsibility policy by providing employment protection to employees who disclose such information. In 1980 the Board approved a policy on expression of staff views which encourages and protects the differing views of employees on policy matters. The Board encourages perception and voluntary expression of differing views involving all aspects of TVA operations, including substantive public health and safety issues and in the design, construction, and operation of TVA nuclear plants. Responsible views may be voiced without fear of recrimination or retribution. Although these disclosures might embarrass a particular individual who has not been performing adequately, the Board takes no such view; it firmly believes differing views expressed by those involved in TVA's various programs are beneficial and essential to the efficient conduct of the agency's business.

Based on its investigation on the PCB allegation, the Office of the General Counsel found that although TVA had legitimate reasons for eliminating this employee's crew, there was evidence that one of the supervisor's motives for recommending the elimination of this crew was retaliation against the employee for responsibly expressing his views on PCB health and safety issues.

The supervisor was suspended for 30 days for this improper conduct.¹

Training on available employee protection provisions is provided to all TVA employees. For the most part this training is conducted by line management in the various offices and divisions and includes group discussions, lectures, posters, handouts on procedures which can be carried in a wallet, and a videotape presentation on the subject. TVA's employee newspaper has also carried information on encouragement of expression of staff views. We are attaching copies of the various materials on employee protection, including TVA Code II EXPRESSION OF STAFF VIEWS, and lesson plans and outlines used to train employees on this subject.

The above example shows that TVA's policy in receiving differing staff views is not merely theoretical or infrequently used. After a weak start some years ago, the policy is now firmly established, and TVA managers and the Board have received employee-stated interests in nuclear safety; public and occupational health and safety; and fraud, waste, and abuse. The Board's own action in support of this protection policy is known throughout TVA and sets the standard it expects managers to follow.

In 1982 The Education Fund For Individual rights, working under a grant from the National Science Foundation, reviewed TVA's program for encouraging differing staff views and the proper resolution of questions raised. The attached letter with supporting material reflects that organization's strong sense of TVA's commitment to its stated policy on employee protection.

Recently TVA contracted with an outside organization to interview employees at the Watts Bar Nuclear Plant and to be available to receive in confidence from all employees nuclear-safety-related issues and other matters (including allegations of reprisal or retaliation) that employees might feel more secure in providing to an outside contractor instead of TVA. The contractor's work is continuing.

1. In a similar sort of case, an employee alleged that while he was a foreman, employees in his crew intentionally altered, tampered with, or delayed work done by themselves or others in the crew. Based on the Office of the General Counsel's investigation, it was concluded that because the foreman, who was not a member of the local union having jurisdiction over the work, would not observe union courtesy and relinquish his foreman's position to a local member, other crew members intentionally submitted incomplete work for inspection and asked others to do the same.

During this same investigation, it was also found that in prior years the same complaining foreman told his crew it would be all right if it intentionally performed incomplete work or slowed down work so more overtime would be available.

3. Matching Techniques

a. Computer Matches

TVA's employee conduct regulations require employees to "pay each just financial obligation in a proper and timely manner," especially debts imposed by law. We view that duty as a term and condition of employment and think that employees have a particular obligation to pay debts owed the Federal Government. TVA can and does take disciplinary action against employees who fail to meet their just financial obligations provided that a nexus can be established between such failure and TVA's performance of its mission.

In recent years, TVA has used computer matching techniques as an important tool in detecting fraud, waste, and abuse. For instance, along with other Federal agencies, it has participated in various computer matches involving unemployment compensation and delinquent student loans under various Federally guaranteed student loan programs. These efforts have benefited TVA and other Federal agencies, and substantial amounts of money have been repaid.

- (1) Unemployment Compensation--In cooperation with the Department of Labor and several States, TVA participated in a computer crossmatch project identifying current and former TVA employees who received Federal pay while simultaneously drawing unemployment compensation insurance benefits during October 1980 through October 1982. Based on that computer match, 175 current or former employees were identified involving \$45,674 in improper payments. Of that 175, 61 were initially identified as current TVA employees.

The departments of employment security for Tennessee, Mississippi, and Massachusetts have determined that in 64 of the 175 cases, individuals fraudulently received benefits. In April 1985 the United States Attorney for the Middle District of Tennessee charged 13 of these with making false statements to obtain unemployment compensation.

For those current employees identified as fraudulently receiving unemployment benefits, appropriate disciplinary action, up to and including termination, is being pursued. The records of former employees not currently employed by TVA have been annotated to reflect this information, and appropriate reemployment restrictions are in place should they attempt to return to TVA employment.

- (2) Student Loans--TVA has also been working with the United States Department of Education (ED) to identify TVA employees having delinquent student loans. ED has requested that TVA, in accordance with 5 U.S.C. Section 5514 (1982) (as amended by the Debt Collection Act of 1982), collect delinquent loans amounting to approximately \$250,000 from 177 current and former TVA employees. ED has provided TVA a written certification of the amount and basis of each debt, the right of the Government to collect each debt, and the process afforded each person, including notice and an opportunity for a hearing. After reviewing the merits of the certification, TVA will begin collection procedures and take progressive disciplinary action, up to and including termination, when supportable.

- (3) TVA Conservation Loans--Through its various power distributors, TVA finances residential energy conservation measures such as insulation, storm windows, and heat pumps for qualified residential customers. In a similar sort of matching process, TVA compares the list of those defaulting on these loans to its current employee roster. To date 17 current TVA employees have been identified as defaulting in their home energy improvement loans. The Office of the General Counsel referred these names to appropriate management for progressive disciplinary action, up to and including termination. All (except for those currently being handled) have repaid their loans or made acceptable arrangements to do so, amounting to \$11,440.01.

b. Telephone Misuse

TVA's long established policy has made it clear that use of its telephone systems for long-distance, personal telephone calls on commercial or FTS lines will not be permitted. For years appropriate TVA managers have reviewed the commercial telephone charges for their organizations to determine if TVA is being charged for employees' personal long-distance telephone calls. TVA treats these matters seriously, viewing misuse of the telephone system as theft from the agency and directly related to the faithful and loyal performance of an employee's duty.

In one case four employees admitted to using a TVA telephone credit card to make approximately \$700 of unauthorized personal, long-distance telephone calls, including numerous calls to friends, relatives, and a lounge in Nashville which they frequently visited when in that area. All four employees were terminated, and TVA recovered the amount which it paid for those calls.

In the last several years, at some of its business locations TVA has had the capability to also review calls made on the FTS system. As they have with commercial billings, TVA managers carefully review these lists to detect any abuse of that system. In one instance an employee used the FTS system for more than 300 minutes of personal, long-distance telephone calls. After being informed of the results of this investigation, the employee reimbursed TVA for the cost of this personal use, approximately \$180, and resigned.

In another case an employee used the FTS system for 184 long-distance, personal calls amounting to 576 minutes. This employee was terminated and reimbursed TVA \$345 for the cost of those calls.

4. Sex and Other Prohibited Harassment

In 1982 the Office of the General Counsel received allegations that the supervisor of the warehouse at one of TVA's nuclear plant construction projects sexually harassed employees under his supervision. After several employees were interviewed, it was clear the allegations were not frivolous, and in consultation with management the employee was removed from his supervisory position until the investigation was completed.

Based on its investigation, the Office of the General Counsel found that the supervisor sexually harassed several female warehouse employees in the following manner:

- a. During a farewell party, he took photographs of a female employee's buttocks and distributed copies to warehouse employees.
- b. During a warehouse luncheon in the presence of several warehouse employees, he introduced his wife to a woman formerly under his supervision as the woman he had "been ----- at lunch."
- c. He made gross and explicit sexual statements to several female employees under his supervision.
- d. He made body gestures with sexual overtones to several female employees under his supervision.

After reviewing the General Counsel's report on this matter, appropriate management terminated this supervisor.

The TVA Board recognizes that TVA has an obligation to its employees to create and maintain a work environment free of sex and other forms of harassment and has issued the following policy statement to all employees:

We are committed to eradicating every form of prejudice or discrimination from all TVA personnel policies and practices and working conditions. We are taking this opportunity to reaffirm our commitment to equal employment opportunity and to affirmative action and to emphasize to you what your responsibilities are.

Employees who have managerial or supervisory oversight of any kind have a special obligation to aggressively carry out TVA's policy on equal opportunity and affirmative action. Managers and supervisors are expected to vigorously support all affirmative action programs designed to eliminate the present effects of past discrimination and to make sure all employment decisions are free from prohibited discrimination. Formal periodic evaluation of managers' and supervisors' commitment to and performance in these areas are incorporated into the management appraisal system and will be strengthened in other service review systems. We will hold each TVA manager personally accountable for promptly identifying deficiencies, for taking or helping ensure appropriate corrective measures in his or her organization, and for strengthening TVA's equal opportunity and affirmative action program.

All TVA employees, especially managers and supervisors, are responsible for supporting TVA policy on equal opportunity and affirmative action and for assuring that the workplace is free from discrimination and harassment. Discriminatory harassment includes ethnic jokes, racial or sexist remarks, conduct of a sexual nature, and other such behavior that affects an individual's employment or unreasonably interferes with an individual's work performance or creates an intimidating, hostile, or offensive work environment. We intend to identify and eliminate any lack of awareness, patronizing or discriminatory posture, be it subtle or blatant, toward minorities, women, or handicapped individuals.

We are asking for your personal commitment and active cooperation in ensuring that true equal employment opportunity becomes a reality in TVA. Failure to comply with TVA policy on equal employment opportunity by any employee may result in adverse action against that employee, including demotion or termination. The General Manager and Director of Equal Opportunity Compliance (EOC) are to keep us fully informed on a regular basis of the progress each TVA organization is making in this regard.

In addition to the Board's policy statement, TVA's commitment to a workplace free of any type of harassment has been included in its conduct regulations, 18 C.F.R. Section 1300.735-21 - .735-39. These regulations specifically prohibit harassment on the basis of sex, race, color, religion, natural origin, age, and handicap.

In another case, the General Counsel investigated allegations that a manager told several employees in his office a joke insulting to Blacks and to members of the Church of Christ.

The investigation showed that over several days the manager told that joke to various employees under his supervision and that he had made other remarks to employees giving the impression that he was intolerant of those of different sexes, races, and religions. The manager was demoted and transferred to another work location.

As the examples show, TVA has had some isolated instances of improper discriminatory or harassing behavior. However, such conduct is not acceptable under the Board's policy and TVA's conduct standards and TVA management has acted strictly and promptly to discipline managers and employees who have violated the policy.

Table I

Allegations of Employee Fraud and Misconduct
1981-1984

Number of Investigations closed between 1981 and 1984 - 1,072

Major categories of the investigations closed between 1981 and 1984:¹

<u>117</u>	involved theft
<u>93</u>	involved falsification of records
<u>105</u>	involved misuse of Government property
<u>42</u>	involved misuse of TVA time
<u>274</u>	involved misuse of Government vehicles
<u>19</u>	involved conflict of interest
<u>23</u>	contract related allegations
<u>53</u>	harassment

Source of complaints of the investigations closed between 1981 and 1984:²

<u>379</u>	were reported to TVA's Citizen Action Line
<u>545</u>	were reported to the Office of the General Counsel
<u>42</u>	were reported to TVA's Board of Directors or the Office of the General Manager
<u>14</u>	were referred from the General Accounting Office

Of the complaints closed between 1981 and 1984

<u>355</u>	were anonymous
<u>717</u>	were nonanonymous

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1. This number represents the most frequently reported categories of fraud and employee misconduct and is not all inclusive of all allegations investigated.
 2. This number represents the sources from which the Office of the General Counsel most frequently receives allegations of fraud and employee misconduct and is not all inclusive of all sources from which allegations are received.

Of the investigations closed between 1981 and 1984, the range of action viewed as supportable by OGC included:

<u>87</u>	termination
<u>70</u>	suspension
<u>9</u>	demotion
<u>59</u>	written warning
<u>44</u>	instruction, oral warning, or reprimand
<u>592</u>	no action warranted

Of those recommendations, offices and divisions took the following action:

<u>44</u>	termination
<u>63</u>	suspension
<u>11</u>	demotion
<u>59</u>	written warning
<u>70</u>	instruction, oral warning, or reprimand

5. An Example of TVA's Response to An Employee Fraud

In 1983 TVA managers discovered that a TVA inventory control officer in the Transportation Services Branch had been working with several outsiders to create false billings to TVA under several TVA auto parts contracts.

The existence of this loss was embarrassing. However, even though the scheme involved active attempts by the employee to circumvent TVA's controls, the corporate arrangements the TVA Board had established--and strengthened since 1979--to respond to allegations of fraud, waste, and abuse properly functioned.

- o TVA managers in the Transportation Services Branch, when they initially found evidence of the fraud, knew where in TVA to immediately report it and to obtain professional help to respond.
- o TVA's General Counsel, who is charged by the Board with investigating and reporting on allegations of employee misconduct, had experienced attorneys and investigators available to handle the matter.
- o TVA has worked to establish a solid relationship with the various United States attorneys and FBI offices and other Federal, State, and local law enforcement agencies in the areas in which TVA operates. Using existing mechanisms, the General Counsel informed the FBI of the possible fraud on the day he was informed by TVA managers.
- o The involved employee was suspended the next day pending the General Counsel's investigation. All TVA funds coming due to him that could be used to offset TVA's loss were frozen. When the General Counsel completed his report, management terminated his employment.
- o At the same time, TVA stopped its payments to the involved auto dealers and stopped using the only then existing contract in the scheme.
- o The United States attorney sought and obtained indictments against the employee and his three co-conspirators. The indictments included 59 counts of conspiracy to defraud by depriving TVA of its money and property in the approximate amount of \$250,000. The United States attorney tried the case with the assistance of the TVA attorney who investigated the fraud for TVA. In these proceedings, all but one pled guilty, and he was convicted by the jury. All four men were sentenced to terms in the Federal penitentiary, heavy fines, and probation.
- o TVA subsequently sued one auto dealer, Mtn. View Ford, Inc., the president and owner of Mtn. View Ford, and several individuals to recover the loss suffered on account of this fraud. The suit, which is in the discovery stage in Federal District Court in Chattanooga, alleges conversion, fraud, misrepresentation, negligent misrepresentation, mail and wire fraud, interstate transportation of goods-money which were stolen or taken by fraud, breach of contract, and violations of the Racketeer Influenced and Corrupt Organizations Act (RICO).

- o There is no proof that any other TVA employee was involved in this fraud. Nevertheless, within TVA every employee who could be identified as having failed to carry out a job responsibility with regard to a procurement, management, payment, or audit function that was connected to the fraud was disciplined for that performance failure. Two employees were suspended; three, who had retired in the interim, had their severance pay reduced the equivalent of 30 days' pay; and many others were warned against like failures in the future.

Thus, while this fraud demonstrated some weaknesses in the implementation of TVA's internal control system by various employees, each of which was exploited to TVA's detriment, the overall corporate arrangement the Board had in place to detect and respond to frauds of any size proved effective.

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1. In addition, the publicity about the fraud and TVA's response to it, both within TVA and outside, have graphically reminded all managers and employees of the value of internal controls and the consequence of individual job performance failures. We are undoubtedly getting improved performance from many throughout TVA as a result. It has also caused us to look closely at many of our more flexible, and more loosely controlled, purchase arrangements and to strengthen controls or eliminate those arrangements.

B. AUDIT REVIEW GROUP

The Audit Review Group (ARG) established in 1981 is a senior level TVA group that monitors Agency-wide: audits, program evaluations, fraud, waste, misconduct, and management improvement efforts. It plays a key role in the formal coordination of planning, reporting, and management follow-up activities related to these functions. The members of the ARG are the General Manager, who serves as chairman, the General Counsel, Manager of Corporate Administration and Planning, the Manager of Audit and Evaluation, the Manager of Planning and Budget, the Comptroller, and the Director of the Public Safety Service. The TVA Board members are ex officio members of the Audit Review Group and participate in its meetings.

The ARG meets at least quarterly to review problems identified in audits, evaluations, and investigations, as well as corrective actions taken by line management. At each meeting, the members report on the latest developments in their areas and bring to the group's attention any management problems calling for resolution or further study. When appropriate, TVA managers whose operations are the focus of ARG attention meet with the group for discussion of the issues involved. In addition to discussing issues identified by each member, the ARG reviews incoming complaints from external sources such as the Citizen Action Line and referrals from the General Accounting Office. The ARG also reviews the annual management letter from TVA's external auditor. The group may request audits, evaluations, or other actions if unresolved generic problems are identified.

C. OFFICE OF AUDIT AND EVALUATION AND TVA'S INTERNAL CONTROL SYSTEM

Internal Controls

The TVA Act of 1933 created TVA as a corporation and provided for the appointment of a Board of Directors to "direct the exercise of all of the powers of the Corporation" and to "provide a system of organization to fix responsibility and promote efficiency." Accordingly, the TVA Board of Directors (Board) has appointed managers to positions of defined responsibility and has worked with those managers in developing policies and procedures that would promote efficiency in TVA's operations and ensure an effective system of internal controls. Since its inception, TVA's systems of internal controls and program evaluations have developed and expanded concurrently with the development of similar management systems in the public and private sectors.

TVA's internal control system is made up of standards, procedures, and controls on the operating offices and divisions; routine financial and performance reporting by the responsible decision units; and the auditing, evaluation, and investigative functions. Audit, evaluation, investigation, and identification of opportunities for management improvement are the primary responsibility of:

- o Office of Audit and Evaluation;
- o Office of the General Counsel;
- o Audit Review Group

In addition to the specific management functions, the Audit Review Group monitors effectiveness of the internal management control system and internal review plans and activities, develops recommendations on unresolved audit or evaluation issues for the Board, and makes recommendations for further improvement in the internal control system or its operation.

Crucial to maintaining effective management control is the involvement of the Board in reviews and discussions of audit and evaluation activities and in ensuring that management follows up on audit recommendations in a timely manner. The planning and follow-up procedures in the present system assures that level of involvement.

The Office of Audit and Evaluation

The TVA Board created the Office of Audit and Evaluation to improve its processes for monitoring organizational performance, providing internal management control, and improving operating performance. Administratively, the Office of Audit and Evaluation is located in the Office of Corporate Administration and Planning but has both routine and exceptional reporting responsibility to the Board. The Board reserves to itself the final determination of disputed findings and recommendations made in audits and evaluations; and it delegates management responsibility for implementing adopted recommendations.

The Office of Audit and Evaluation consolidates corporate monitoring and improvement functions and provides the Board an improved means of managing

these activities consistent with Board priorities. This office is the official arm of the Board for ensuring objective financial control. It conducts special purpose and expanded scope audits, program evaluations, and management reviews; and promotes and improves the efficiency and effectiveness of TVA's management, programs, and operations. The Office of Audit and Evaluation recommends to the Audit Review Group and the Board priorities in audit, evaluation, and improvement activities. Implementation of findings and recommendations are monitored and quarterly progress and completion reports are made to the Audit Review Group and to the Board by the Office of Audit and Evaluation. The office consists of two branches: the Auditing Branch and the Corporate Industrial Engineering Branch. Their functions follow.

Audit Function: The Auditing Branch, under the supervision of the General Auditor, is responsible for carrying out the corporate audit function within TVA. Audits of TVA's activities include accounting records and financial statements; accounting systems of internal control; records and operations of certain outside contractors for determining contract compliance; existing and new-developing computer systems for security, protection, and control. The branch also performs operational audits of TVA activities and makes special audits upon request. In fiscal year 1984, the General Auditor issued 108 audit letters and reports involving all areas of TVA's business. These reports questioned almost \$21.6 million in costs of which nearly \$21 million have been recovered to date, and all but \$91,000 of the remainder (about .4 of 1 percent) has been settled through contract negotiations.

The Auditing Branch includes 39 professional employees; all these employees have experience and college degrees in accounting and related fields. Thirteen are licensed certified public accountants (and three more are awaiting licensing by the State); two are certified internal auditors; and one is a certified information systems auditor.

The General Audit Section audits certain functions within TVA for compliance with accounting procedures and management policy and to test the reliability of the accounting system. Year-end audits are made of the detailed reports supporting TVA's published financial statements and of the form and content of the Federal Energy Regulatory Commission and Power Annual Reports. During interim periods, audits are made on a test-check basis of the revenues and expenses of TVA programs, construction costs, plant and inventory records, payroll and leave records, systems of internal control, and the application of prescribed accounting procedures; and all cash accounts are reconciled. The General Audit Section prepares and maintains a file of abstracts for all receipts contracts for comparison with detailed billing records in the accounting offices.

The ADP Audit Section reviews and evaluates existing and new-developing computer systems from the standpoint of security, protection, and accounting and auditing controls. It devises, develops, and implements auditing techniques and programs to maximize the use of computers in the work of the Auditing Branch. It performs operational audits of computer centers and reviews organizational structure to ensure proper separation of duties and effect on controls over use of computer center resources and job accounting systems. It reviews the utilization and security of equipment and stored data, the programming and processing documentation, input and output validation, error correction, and scheduling procedures.

The General Contract Audit Section audits cost reimbursement contracts (not handled by the Western Uranium Audit Section) and all contracts other than coal, such as area development activities, trust funds, van pool project, and personal services. It performs preaward audits and advises contract administrators on accounting and auditing matters.

The Coal and Litigation Contract Audit Section audits cost reimbursement contracts for procurement of fossil fuels; reviews claims involving gross inequities, contract terminations, defaults, and escalations; testifies for TVA in administrative and judicial proceedings and furnishes information to assist in the settlement of claims. The section performs preaward audits and advises contract administrators on accounting and auditing matters.

The Western Uranium Audit Section audits cost reimbursement contracts for procurement of nuclear fuels in the Western United States. It reviews and verifies accounting and financial data for purposes of determining the accuracy and reasonableness of accounting records of the contractors involved in nuclear fuel exploration, mining, and milling of uranium ore; the adherence to the terms of the contracts; and the protection of TVA's interest with regard to assets. This section performs preaward audits and advises contract administrators on accounting and auditing matters.

The Operational Audit Section reviews and evaluates specific segments of TVA activities for compliance with management plans and policies; applicable laws, regulations, and procedures; adequacy of controls; and the economy of operation or related matters. It conducts reviews when requested by the General Manager and others, of specific segments of TVA's activities. It works closely with the Corporate Industrial Engineering Branch in areas related to management improvements, operational efficiency, and management counseling.

Evaluation and Improvement Functions: The Corporate Industrial Engineering Branch, under the supervision of the Corporate Industrial Engineer, is responsible for conducting a comprehensive evaluation and improvement program. The branch conducts program and management evaluations, and initiates improvement actions in TVA through the industrial engineering program and management consulting services. These activities are consistent with the general objectives of OMB Circular A-117. In fiscal year 1984, the activities of the branch resulted in potential annual savings for TVA of an estimated \$10.2 million and one-time savings of more than \$5.6 million.

The branch is currently composed of 21 professional employees whose educational background and experience includes industrial engineering, industrial management, economics, management consulting, program evaluation, and business systems and operations. The resources of the branch, in conjunction with those of the Auditing Branch, are used in the conduct of expanded scope audits.

The Program Evaluation Section is responsible for conducting evaluations of TVA's programs to assist with management and policy decisionmaking. Program evaluations are formal assessments, through objective measurements and systematic analyses, of the manner and extent to which TVA programs achieve their objectives or produce other significant benefits. In the past, program evaluations were conducted by evaluation teams usually headed by a manager from the line organization that was responsible for the program. The Office of Audit and Evaluation now has lead responsibility for every program evaluation.

The Management Review and Consulting Section conducts management reviews on an organizational or functional basis and provides internal management consulting support to the Agency. Management reviews conducted by this section assess the effectiveness of organizational structures and relationships; operating procedures and systems; and work force requirements and utilization. These reviews result in recommendations to improve the quality and timeliness of operational performance, to increase productivity, to control costs, and to mitigate adverse aspects of TVA's operations. This section also analyzes specific problem areas, recommends improvement actions to the responsible manager, and provides management consulting advice.

The Field Industrial Engineering Section promotes efficiency and economy in TVA's major field operations and support areas. This is accomplished through improvement projects conducted by the section and by decentralized industrial engineering staffs working under the functional guidance of the corporate staff. Cost control, productivity improvements, work force utilization, and other problem-solving and management improvement work are targeted by this section. It also provides industrial engineering technical support to other related TVA activities.

The Office Industrial Engineering Section promotes operational efficiency and economy in TVA's office-type operations. It provides direction for the planning and achievement of productivity improvement and cost reductions in such operations throughout TVA. The section also accomplishes major improvements projects, develops technical procedures for the office industrial engineering function, and provides specific cost-reduction and problem-solving services for TVA managers.

Within the Office of Audit and Evaluation, the detection of fraud, waste, and error and the promotion of improvement actions are given the highest reporting level and the office's handling of these functions makes them independent of TVA's line organization. Accordingly, the Board of Directors is alerted on a scheduled and formal basis of findings and opportunities so that it can respond.

The following sections focus on the integrated corporate process used in the planning of investigations, audits, evaluations, and improvements; in establishing priorities; and in following up on findings, recommendations, and improvement actions.

Planning

TVA's integrated corporate review process consists of three planning levels--the long-range plan, the annual plan, and specific project level plans required for individual audits, evaluations, and improvement activities. Each of these planning levels is described further below.

Long-Range Plan: The long-range plan is prepared to provide for systematic reviews of the entire corporate program and management system on not less than a five-year cycle and to ensure continuing dedicated efforts on improvement actions. Sensitive or vulnerable programs and activities are audited or evaluated as often as necessary to ensure adequate performance monitoring and fiscal and management accountability. This requires that the different TVA offices and divisions, projects, programs, and activities be audited or evaluated on a

one-, two-, three-, or five-year cycle. A selective schedule of improvement efforts is also required. Some staff resources are scheduled to perform audits and evaluations of management issues raised in the current year by constituents, TVA management, the General Accounting Office, or by congressional initiatives. Staff will also focus on improvement initiatives.

The long-range plan provides selected information for each of the five years on the planned work: (1) the basic areas planned for audit, evaluation, or improvement effort, (2) the probable objective; and (3) an estimated allocation of staff hours. This plan is updated annually, coordinated within the Audit Review Group, and submitted to the Board for its review prior to the beginning of each fiscal year.

Annual Plan: An annual fiscal year plan establishes the priority of activities and serves as the operating plan for TVA's auditing, evaluation, and improvement activities. The plan is developed by the Office of Audit and Evaluation and formally coordinated in the Audit Review Group. Flexibility in the annual plan is achieved by using this same procedure to update the plan during the year in accordance with changed circumstances or new priorities. The annual plan translates the long-range plan into a definitive work plan providing the audit and evaluation categories, purpose, scope of work, and resource allocations.

Annual planning activities are categorized as follows:

1. Expanded Scope Audits.
2. Audits
 - a. Financial and Compliance.
 - b. Automated Data Processing (ADP).
 - c. Operational.
 - d. Contracts
3. Evaluations and Improvements.
 - a. Program Evaluations.
 - b. Management Reviews and Management Consulting Services.
 - c. Field Industrial Engineering Improvement Activities.
 - d. Office Industrial Engineering Improvement Activities.

A number of factors are considered in developing and assigning priorities to the annual plan activities. The more important of these factors are:

1. The perceived adequacy of management system and controls.
2. Experience and results from prior auditing, evaluation, improvement, and investigation activities.

3. The dollar magnitude and duration involved.
4. Newness, changed conditions, sensitivity or vulnerability of individual programs or operations.
5. Management needs as developed in consultation with program and operating managers.
6. Coverage of audit/evaluation reports prepared by others (General Accounting Office, independent public accountants, etc.).
7. Congressional recommendations and legislation or regulatory requirements.

Audits, evaluations, reviews, and improvement projects are selected and priorities are assigned based on these important factors. A preliminary plan for the conduct of each project also is developed at this stage with an estimate of resource requirements. Resource requirements and scope of the activities planned in all of the audit and evaluation categories are accounted for. The annual plan is formally coordinated in the Audit Review Group and is submitted to the Board with the corresponding long-range plan prior to October 1 of each year.

Expanded Scope Audits--The Office of Audit and Evaluation selects those TVA program and operation areas where expanded scope audits will be performed and plans the necessary activities to accomplish the effort. These major where expanded scope audits will be performed and plans the necessary activities to accomplish the effort. These major audits encompass the three elements of expanded scope auditing--financial and compliance, economy and efficiency, and program results. This is consistent with the General Accounting Office publication, Standards for Audit of Governmental Organizations, Programs, Activities, and Functions (1981 revision). These three elements provide the users of the audit reports with full accountability of the programs or operational activities involved. An expanded scope audit is not always needed, nor always desirable. The above referenced GAO publication recognizes:

An audit of a government entity may include all three elements or only one or two. It is not intended or even feasible or desirable that every audit include all three. The expanded scope audit should not be conducted routinely, but instead selected when it will meet the needs of expected users of the audit results.

Expanded scope audits will encompass the various audit and evaluation elements.

Audits--Audits are directed toward ensuring the continued integrity of TVA's resources and management systems. These audits range from single objective to multiobjective reviews that encompass some or all of the purposes discussed below.

Financial, ADP, and operational audits address broad management control purposes.

1. The soundness, adequacy, and application of accounting, financial, and operational controls.

2. Determining the extent of compliance with established policies, plans, procedures, and applicable laws and regulations.
3. Determining the extent to which TVA's assets are accounted for and safeguarded from losses of all kinds, including fraud, waste, and abuse.
4. Determining the reliability of accounting and other operational performance data developed within TVA.
5. Appraising the organizational performance in carrying out assigned responsibilities to identify actual or suspected conflict in corporate and program policies, or ineffectiveness or inefficiencies in programs that impede achievement of TVA goals. Appraisal results are coordinated with the Corporate Industrial Engineering Branch for planning and conducting management improvements to address problem areas.

Contract audits address specific TVA/vendor contractual compliance and accountability.

1. Determining the allowability, accuracy, and reasonableness of the contractor's reported costs and claims against TVA.
2. Reviewing the contractor's procedures that protect and provide for disposition of TVA-owned property or property acquired under the contract.
3. Reviewing the contractor's accounting systems and internal controls which should prevent wasteful or inefficient practices in the performance of TVA contracts.
4. Determining that objectives of the contract are being achieved efficiently and economically.
5. Providing advice on accounting and financial matters to contract administrators to assist them in negotiation, administration, changes, and settlement of contracts.
6. Determining the financial condition of contractors in default and their ability to pay damages to TVA.

The annual plan delineates the specific audits selected for accomplishment during the fiscal year to ensure that the criteria and current management objective is systematically considered in establishing priorities and developing the annual plan of work.

Evaluations and Improvements--Program evaluations, management reviews, and other improvement activities are included in this category and discussed below.

Program evaluations in the annual plan consist of those TVA program areas selected for a formal assessment through objective measurement and systematic analysis. Emphasis is on the manner and extent to which the programs achieve objectives or produce other significant effects. The goal is to assist program management and policy decisionmaking. This evaluation category examines TVA programs from the perspective of the effectiveness of achieving service delivery to users and impact on the targeted population external to the corporation.

Also included are internal TVA functions or services that require close monitoring of effectiveness in program support, or involves management policy.

Management reviews or evaluations are formal assessments of the efficiency of corporate organizational, program, or functional operations. They include assessing the adequacy of organizational structures and relationships, operating procedures and systems, and work force requirements and utilization. As such, management reviews perform two basic functions--assessing the effectiveness of management systems performance and providing consulting assistance in developing more improved management systems. Thus, the end purpose of this activity is to design and achieve the implementation of more improved management systems and procedures.

Corporate consulting services are provided to TVA managers on issues or problems involving productivity, management systems, administrative procedures, control systems, and effective staffing. Such activities are normally short term and require minimal follow-up. However, consulting services regarding policies, strategies, or organization can often involve complex issues and can require both extensive analysis and significant project effort.

Field industrial engineering improvement activities address efficiency and economy in TVA's major field operations and support areas. This is accomplished through improvement projects which are both corporate directed efforts and efforts initiated by line managers within their areas of responsibility to improve the effectiveness or efficiency of TVA's operations. Individual projects may be part of a major effort with multiple projects strategically scheduled to accomplish phased improvement over time or may address a targeted improvement area which may be achieved through a single project. These efforts are planned and scheduled either through the initiative of the line manager or the Office of Audit and Evaluation.

Office industrial engineering improvement activities address efficiencies and economy in TVA's office-type operations. Office-type operations include activities involving administrative and clerical support, logistical support, and managerial and professional services. Improvements are accomplished through projects which are both corporate directed efforts and efforts initiated by line managers within their areas of responsibility to improve the efficiency or effectiveness of TVA's operation. Projects are planned and scheduled through the initiative of the line manager or the Office of Audit and Evaluation.

Specific Activity Plans--Each of the audit, evaluation, and improvement projects involving significant effort is planned in detail upon the initiation of the project to identify the major objectives, approach, activities, and schedule. These plans are revised to incorporate new activities or objectives that arise during the course of the evaluation.

Reporting and Follow-up

Reporting and follow-up of investigation, audit, and evaluation activities are designed to provide top management findings and recommendations of the completed activities, a system for monitoring progress in audit and evaluation performance, and in the implementation of previously developed and adopted

recommendations. Specific policy or management issues or exceptions to achieving the planned program of work are highlighted in the report for top management attention.

Reporting the progress and outcome of investigations and management improvements is vital to the successful accomplishment of improvements. Two types of written reports are prepared:

- o Formal written reports are issued upon completion of the findings, and report recommendations are used as a basis for management actions;
- o Memorandum informational reports are used by top management to monitor the status of specific investigations, audits, evaluations, improvement, and follow-up activities.

Formal written reports are prepared for each audit, evaluation, improvement project, and investigation, giving the results of the review and findings. Formal reports are issued promptly at the time of project completion for timely use by management. (Occasionally, written interim reports are prepared.) The reports are made available to officials with direct management overview or action responsibility, to the Board, and to the Audit Review Group. Reports contain descriptions of the scope and objectives of the audit, investigation, or evaluation. These reports also include descriptions of errors, weaknesses in controls, significant instances of noncompliance, and other deficiencies, as well as recommended actions to be performed by specific organizational elements. Those organizations audited or evaluated are required to either concur in writing or provide written basis for their disagreement.

Adoption of audit and evaluation recommendations is made after a thorough review and discussion by the managers responsible for corporate decisionmaking and implementation. Written reports provide top TVA and program management with an understanding of the situation, issues, findings, and improvement recommendations made by the audit and evaluation team. Where there are no major disagreements on the findings and recommendations by the organization being audited or evaluated, the report is accompanied by a general plan for implementing the recommendations for the Board's review and concurrence.

Where serious differences exist concerning the facts, the seriousness of a deficiency, or the action required to correct a deficiency, the organization under review may provide its response as an addendum to the report. The Audit Review Group reviews the document and recommends the approach management should take to resolve the dispute or suggests actions that the Board may take with respect to the problem identified.

Recommendations adopted by the Board are assigned to specific managers for implementation and become a formal follow-up activity monitored by the corporate staff that made the findings and recommendations. Progress in implementation of investigations, audits, evaluations, and follow-up improvement projects are monitored and reported to top management as described below.

In addition to the formal written reports, periodic memorandum informational reports are prepared to keep the Board and appropriate levels of management informed about the status of specific audits, evaluations, and improvements. A periodic summary of investigations conducted by the Office of the General

Counsel is also submitted. The status of the follow-up activity being conducted in each of these areas is reported and exceptions that require management and Audit Review Group attention are highlighted.

Follow-up consists of an evaluation of the adequacy of the responses received from organizations responsible for taking corrective actions on recommendations, and the tracking of those actions to their completion. For recurring audits, a follow-up on the implementation of corrective actions is made during subsequent audits. For one-time audits or evaluations, follow-up is performed at the end of the period allowed for the implementation of changes and actions, and the results are transmitted to the Audit Review Group and the Board, if necessary.

The follow-up process is inherent in the formal written reports, the periodic informational reports, and Board briefings. Each of the report recommendations are controlled through a formal system where they are tracked until they have been implemented. The status of these recommendations is summarized monthly, and departures from adopted recommendations are identified and discussed with the Audit Review Group. When recommendations have been satisfactorily completed, formal documentation of this fact is included in the original investigation, audit, or evaluation report files.

10. Question: Please give the construction cost per square foot of new office buildings built by TVA in the past 10 years.

Answer: While these buildings were constructed specifically for TVA, the actual construction was performed by private contractors. Design criteria varies from basic office space to state-of-the-art energy efficiency.

<u>New Buildings</u>	<u>Start/Complete</u>	<u>Construction Cost</u> <u>Per Gross Square Foot</u>	
		<u>Current \$</u>	<u>1975 \$</u>
TVA			
Land Between the Lakes Administrative Building Golden Pond, Kentucky	Aug. '73/ March '75	36	36
Office Service Building Muscle Shoals, Alabama	May '76/ May '77	25	21
Natural Resources Bldg. Norris, Tennessee	Sept. '77/ April '80	46	29
Multipurpose Building Muscle Shoals, Alabama	Sept. '81/ Oct. '82	35	19
Chattanooga Data Center ^a Chattanooga, Tennessee	July '80/ July '82	101	56
Chattanooga Office Complex Chattanooga, Tennessee	Nov. '80/ Nov. '85 ^b	89 ^c	43

- a. 70 percent office space, 30 percent computer operations space.
b. Estimated completion date, currently under construction.
c. Estimated cost at completion.

11. Question: Is TVA planning to construct or renovate any new office space in the next 10 years? If so, please list and describe the proposed projects.

Answer: TVA does not presently have plans for the construction of additional general purpose office space.

Renovation is in progress on two historic facilities which jointly contain approximately 83,000 gross square feet, and one additional renovation is planned which contains approximately 88,500 square feet.

The two renovations in progress are both historic facilities and are recognized as such in their respective communities.

--Renovation of the Old Forestry Building, constructed in 1933, located in Norris, Tennessee, is scheduled for completion in late 1985 and contains approximately 24,000 gross square feet.

--The Old Post Office Building, constructed in 1893, located in Chattanooga, Tennessee, contains approximately 59,000 gross square feet and is scheduled for completion in April 1986.

The additional planned renovation is the Edney Building, located in Chattanooga, Tennessee, which contains approximately 88,500 gross square feet and is an integral part of the total TVA Chattanooga office space needs. This facility, built in 1952, was purchased by TVA in 1969 and will be renovated in order to provide a safe, more functional, and economic work environment. This renovation is projected for fiscal year 1987.

12. Question: Please provide a listing and cost of each TVA land purchase since 1980 and describe the average purpose for which the land was purchased.

Answer: Following is a listing and cost of TVA land purchases since 1980 and the general purpose for which the land was purchased. Included are land, improvements, and other associated costs. This answer does not include easements for rights of way for electric power lines. Individual tract numbers, acreage, and costs are available.

Purchases Financed From Power Proceeds

Purchased in fee 202 tracts containing 5,600 net acres at a cost of \$5,880,756 for coal reserves located in southern Illinois.

Acquired coal properties in fee pursuant to an exchange agreement with Exxon Coal Resources USA, Inc., to consolidate TVA coal reserves within the Ewing-Northern Coalfield located in southern Illinois comprising 228 tracts containing 7,764 net acres.

Purchased in fee uranium mill decommissioning disposal area located in Edgemont, South Dakota, comprising six tracts containing 2,620 acres at a cost of \$632,655.

Purchased in fee for the uranium mining program five tracts containing 12,892.9 acres at a cost of \$159,172.

Purchased in fee 18 substation sites containing 208.4 acres at a cost of \$799,898.

Purchased easements for relocation of access roads to two substation sites containing 2.38 acres at a cost of \$5,450.

Purchased in fee 12 sites for microwave repeater stations containing 7.12 acres at a cost of \$25,950.

Purchased easements for access and clearing 10 microwave repeater station sites containing 6.47 acres at a cost of \$40,375.

Purchased in fee three tracts for Widows Creek Steam Plant scrubber sludge disposal area containing 57.3 acres at a cost of \$274,000.

Purchased 107 easements to install poles and sirens for the public warning systems at Browns Ferry, Sequoyah, and Watts Bar Nuclear Plants at a cost of \$52,625.

Purchased in fee three tracts containing 4.83 acres at a cost of \$15,525 for highway and railroad to serve Phipps Bend Nuclear Plant.

Purchased in fee 59 tracts containing 158.01 acres at a cost of \$549,000 for Yellow Creek Nuclear Plant.

Purchased five easements containing 14.43 acres at a cost of \$27,500 for Yellow Creek Nuclear Plant.

Purchased in fee one tract containing 117 acres at a cost of \$250,000 for Raccoon Mountain Pumped-Storage Plant.

Purchased in fee three tracts for Bull Run Steam Plant railroad extension containing 5.1 acres at a cost of \$115,200.

Purchased in fee one tract containing 70 acres at a cost of \$95,000 for Cumberland Steam Plant.

Purchased in fee 14 tracts containing 1,236.01 acres at a cost of \$1,149,225 for Paradise Steam Plant.

Purchased one easement containing 0.4 acre in the amount of \$4,000 for Paradise Steam Plant.

Purchased in fee 10 tracts of land, located in downtown Chattanooga, containing 16.59 acres at a cost of \$4,631,750 for the TVA Chattanooga Office Complex.

Purchased in fee one tract (Courtland Air Base) containing 2,245 acres at a cost of \$2,250,000 for use as a future energy research or production facility.

Purchases Financed With Appropriations

Purchased in fee 24 river access sites for recreation programs containing 52.66 acres at a cost of \$194,850.

Purchased easements for three river access sites for recreation programs containing 1.15 acres at a cost of \$4,900.

Purchased in fee two tracts containing 4.37 acres at a cost of \$9,675 for South Chickamauga levees for flood protection (city of Chattanooga).

Purchased in fee eight tracts containing 193.25 acres at a cost of \$252,998 for the Columbia Reservoir project.

Purchased easements over 28 tracts containing 34.53 acres at a cost of \$72,466 for the Columbia Reservoir project.

Purchased in fee three tracts containing 66.8 acres at a cost of \$189,293 for Bear Creek Reservoir projects.

Purchased easements over 54 tracts containing 705.86 acres at a cost of \$657,825 for Bear Creek Reservoir projects.

Purchased in fee right of way for road access to Murphy Hill coal gasification plant site 36 tracts containing 52.21 acres at a cost of \$164,325.

13. Question: Does TVA expect any major "structural" changes in the Valley economy by the year 2000 such as a shift away from heavy industry and towards the so-called "information industries"? If so, how does TVA decide whether or not such a shift is healthy for the Valley? TVA's economic development programs then reflect this judgment? If so, please detail how they do.

Answer: The current forecast of long-term economic activity in the Tennessee Valley does not forecast a major structural shift of production away from heavy industry. Many of these industries have made significant improvements in productivity in the past few years. Although many firms will continue to face tough competition from abroad and will have to continue to cut costs and improve productivity, we expect that the region will retain a comparative advantage for heavy industry, at least within the United States, as well as manufacturing in general.

Our forecast assumes that by the 1990s the primary impact of the "information industries" will be felt in the Valley's factories through an upgrading of the region's production processes to use more "knowledge-intensive" technology. Knowledge-intensive production is assumed to evolve in the region in response to the pressure of foreign competition. This pressure will place a premium on higher productivity and quality control; over time it also will make the Valley's past position as a "low-wage" producer increasingly less important.

Manufacturing production in our forecast continues to grow in the Tennessee Valley at rates comparable to the United States for the rest of the 1980s and slightly faster than the United States in the 1990s. There is a change in the mix of industries away from the Valley's traditional low-wage base in textiles and apparel and in favor of some "high-technology" production in instruments and the machinery industries. However, this shift is not expected to occur in the Valley as rapidly as in the United States generally.

In general, the shift from lower productivity industries to higher productivity industries means higher wages and incomes. That is a healthy continuation of a trend that has been a principal source of the improvement in economic conditions in the Valley over the past 50 years.

The main problem posed by this knowledge-intensive future is that it may be increasingly difficult for the Valley to generate enough jobs to keep up with the growth in the labor force, and it may become increasingly difficult for some Valley residents to qualify for some of the better jobs that are created.

Employment growth in the Valley from 1960 to the mid-1970s was dominated by manufacturing. The rapid expansion of branch plants in the nonmetropolitan parts of the Tennessee Valley created new manufacturing jobs at an unprecedented rate. This manufacturing

boom--caused by an abundant supply of labor, the completion of the interstate highway system, and other regional advantages--seems to be at an end in the Valley. This slowdown, combined with higher productivity on the factory floor, may limit future prospects for new jobs from the manufacturing sector.

We forecast that services will pick up part of the employment slack left by manufacturing, although there are uncertainties here as well. The Valley's manufacturing has been dominated by branch plants with headquarters located in the industrial Midwest or in other parts of the United States. The result has been that business and financial services, many of which develop to support corporate headquarters and R&D facilities, are not as well represented in the Valley as elsewhere. Moreover, this is one of the fastest growing segments of the U.S. service sector, and as many as one-third of new U.S. service jobs have been related to producer services. The Valley has lagged in this area in the past, although an upgrading of the quality of the region's factories (attracting more engineering support and R&D) could improve this record.

Further, relatively low incomes in the Valley, a large nonmetropolitan population, and a lack of cities of over one million (where many highly specialized services seem to cluster), have slowed past service sector employment growth in the Valley. These factors seem likely to continue into the future. The result of slow service sector job growth, combined with a future with fewer new manufacturing jobs, could be a serious long-run employment deficiency in the Tennessee Valley.

TVA has analyzed past trends and future prospects in the manufacturing, as well as the service, sector of the region's economy. This analysis is used as a foundation for the agency's forecasting efforts and to assist in the design of economic development proposals throughout the agency.

A few examples of how TVA's programs reflect the changes expected in the economic structure of the Valley follow:

A limited interruptible power rate has been implemented which was designed with the cooperation of many of our larger electric-intensive firms in the "heavy industries." The power made available under this rate has been contracted for enthusiastically by these firms and should help them make the "transition" necessary to adjust to the more competitive environment they will meet in the future.

The atmospheric fluidized-bed combustion pilot plant being built under TVA's leadership and initiative, financed in part by power funds, will assist the region's depressed mining industry and make use of the Valley's abundant reserves of higher sulphur coal, as well as reduce future power costs by improving plant efficiency and reducing the costs of environmental controls.

TVA's forestry program has implemented initiatives to help develop markets and uses for the abundant low-grade hardwoods in the Valley. Over time, the program will improve the value of the Valley's forest resources and stimulate the development of new industries to utilize those resources. In addition, the research program to utilize the region's hardwoods for ethanol production is progressing.

In cooperation with EPA, TVA is designing a "water-bubble" system of water quality regulations, which can be combined with TVA's reservoir releases improvement program, to make possible a significant reduction in water pollution control costs for Valley industry if ultimately implemented on a Valley-wide basis.

A program has been implemented, in cooperation with the distributors of TVA-generated power, to help existing industries in the Valley expand. This program is designed, in part, to take up the slack caused by the slowing down of the "branch plant" trend.

In cooperation with educational and training institutions in the Valley, the agency has implemented a skills development program to demonstrate how Valley workers can be helped to acquire the skills that will be required by the "infrastructure-intensive" factories of the future.

14. Question: What effect do you anticipate projected economic conditions will have on electric power demand in the Valley? How is TVA planning for this now?

Answer: TVA produces a range of forecasts (high, medium, and low) to account for uncertainty in load growth. The high load forecast is for a growth in peak requirements of 3.2 percent per year and corresponds to a high rate of economic growth of 4.7 percent per year in Gross Regional Product (GRP). The medium forecast has the highest probability of occurring and is for a growth in peak requirements of 2.5 percent per year and corresponds to growth in GRP of 3.8 percent per year. In the low forecast, peak load grows at 1.6 percent per year and GRP at 2.3 percent per year.

TVA, based on a conservative management philosophy, is currently preparing to meet the high load forecast and high growth in GRP. In the high case, TVA will need new generation capacity around 1995. In the medium forecast, new capacity will not be needed until the year 2001. In the low forecast, new capacity will not be needed until 2010. TVA is committed to having capacity available to meet load growth as it arises. However, in providing this capacity it is TVA's intention to maintain as much flexibility as is practical and not commit to a particular source of new generation until the quantity needed and the costs of the options for obtaining it are more clearly defined.

15. Question: Please describe TVA efforts to keep and establish heavy industry in the Valley.

Answer: TVA makes a significant contribution to the well-being of the region by providing a reliable and low-cost source of electricity to the consumers of TVA power, a critical issue with large, energy-intensive industries. To help accomplish this, TVA has maximized its efforts in cost containment and efficient power production. During the past four years, billing charges for TVA power have remained essentially flat while the rest of the Nation generally has continued to experience significant power rate increases. TVA industrial rates are among the lowest in the Nation. With the increased emphasis on efficiency, TVA has also set new national records for efficient operation of its coal-fired steam plants. Beyond the commitment to maintaining a reliable, cost-effective system, two of TVA's more recent efforts to reduce costs and increase flexibility to meet the needs of the power system and of large industrial power users are: limited interruptible power (LIP) and experimental test energy (ETE).

Limited interruptible power (LIP) arrangements, which were initiated in 1983, allow industrial customers to take a block of power at a lower rate--about 30 percent less than firm power--reflecting TVA's right to curtail or interrupt load for extended periods. In addition to increasing TVA's operating flexibility, LIP increases system efficiency, thereby benefitting all TVA customers by bringing in more revenue (from sales that otherwise might not have been made). Seventeen industrial customers have already entered into LIP arrangements, two contracts are pending company review and execution, and contracts are being prepared by TVA for contemplated arrangements with two other customers.

TVA has worked extensively with the Department of Energy to find ways (which would not be detrimental to other electrical consumers) to reduce the costs of uranium enrichment at DOE's Oak Ridge and Paducah plants. One recent development resulting from this effort, Experimental Test Energy (ETE), is designed to help large industries test flexible operating modes that would enable them to use low-cost electric energy that is produced during non-peak periods of electric power production. Under such arrangements at the DOE facilities, the net energy cost is expected to be about 20 percent below the DOE firm energy rate. Although presently being applied only to DOE, ETE, if successful, could be made available to other larger industries for similar experiments that could result in a better application of electric power in the TVA region and expanded industrial production in the region.

In addition to these recent developments, TVA offers several other power supply options to meet the needs of new and expanding industry in the region. Among the options are firm power, 5 percent interruptible power, standby power, supplemental power, and standby power for cogeneration facilities. These options allow each industry to select the most cost-effective combination for

its particular needs. TVA also offers its industrial customers time-of-day rates, and flexible billing arrangements are available to new and expanding industries during the initial startup and testing phase.

In addition, TVA continues to operate its reservoir system pursuant to the TVA Act for the purposes of navigation. The availability of low-cost, energy-efficient barge transportation has in the past been a significant factor in the location of heavy industry in the TVA region. We recently completed construction of a new lock at Pickwick Landing Dam which will enhance navigation capability and, jointly with the Corps of Engineers, are conducting studies for navigation improvements at other facilities. Another activity related to industrial development is TVA's program of assisting State and local governments. This primarily involves furnishing technical assistance as to site location, economic studies, and environmental compliance. In appropriate circumstances TVA makes land or landrights along its reservoirs available for such industrial development.

16. Question: Please explain in detail TVA's efforts to expand international markets for forest products. How is this being done? What nations are being targeted? With whom is the U.S. competing for these markets? How successful have these efforts been? By doing this, is TVA helping the Valley region take business away from other timber exporting regions of the nation?

Answer: At the direction of the appropriations committee in the fiscal year 1985 appropriations, TVA has taken special steps to aid in the economic development of the portions of the Valley along the Tennessee-Tombigbee corridor. TVA is assisting wood producers in northeast Mississippi and northwest Alabama to assess their competitive position and export capabilities as a result of the transportation advantage provided by the Tennessee-Tombigbee Waterway. This is a demonstration effort, and the forest products export potential may later be expanded to include other Valley areas. TVA is working primarily through the University of Alabama International Trade Center; the Mississippi Department of Economic Development, Marketing Division; the Alabama and Mississippi State Forestry Commissions; and the Appalachian Regional Commission to provide specific information on overseas markets, as well as technical assistance in exporting and production technology to wood products industries in the 17-county demonstration area. This cooperative effort includes a survey of forest products industries in the area to assess their capability and interest in exporting, a market survey in targeted countries, analysis of the industry and market information to determine opportunities for exporting, and technical assistance to firms who wish to enter these markets.

Because the corridor area has surplus hardwood timber, TVA and its cooperators have focused on assessing the export potential for specific sawn hardwoods, i.e., red and white oak. Target markets are the United Kingdom, France, Italy, F. R. Germany, and Spain. The U.S. competes for these markets with France, F. R. Germany, Italy, and eastern European nations, as well as with various tropical countries in the Far East and Africa.

TVA and its cooperators are also assessing the export potential of sawn softwoods, especially clear and construction lumber, in the United Kingdom, F. R. Germany, and southern Europe. The U.S. competes with the Nordic countries, the U.S.S.R., and Canada for these markets. Export potential of treated and untreated sawn softwoods in the Caribbean area and South America (Puerto Rico, Jamaica, Dominican Republic, Mexico, and Venezuela) will also be assessed in the near future. Primary competition is from Honduras, Chile, Guatemala, and Canada.

At this preliminary stage, producer and market information is being collected and analyzed. The short-term success of the effort will not be known until after the information has been analyzed and provided to appropriate firms, and sales have been attempted in foreign markets. Long-term success will ultimately

depend on many factors, including long-term commitment by producers to develop export markets, the international economy, and the competitive advantage of producers in specific markets.

TVA efforts to expand international markets for forest products will not be a significant factor in taking business away from other timber exporting regions of the Nation. The efforts are directed toward development of new markets. Any information obtained as a part of this effort is public information and will be available to all current or potential U.S. timber exporters. There may be some very limited competition with the Pacific Northwest in sawn softwoods, but that region's main competitor is Canada. A primary competitive advantage of the demonstration area and the adjoining mid-South area lies in the newly completed Tennessee-Tombigbee Waterway and its projected reduction in transportation costs, which should be particularly helpful in penetration of Caribbean softwood markets.

17. Question: TVA's annual report for 1984 states that more than 11,000 people were trained and placed in private sector jobs with TVA assistance. Please describe in detail TVA's various roles in helping train these people. In addition, please list and describe other forms of assistance (State, private, Federal, etc.) which went into training these same people; include in this description the proportions of TVA and non-TVA funds used.

Answer: Prior to TVA involvement a great many education and training systems within the Valley region did not anticipate or respond to changes in the number and type of job skills needed by new and expanding industries. Failure to do so impeded the ability of States to upgrade employment and income opportunities for their citizens. Thousands of people were being trained for jobs where the number of trainees greatly exceeded the available jobs in such areas as agricultural mechanics, air-conditioning, and body/fender repair. TVA's skills development program, through forecasting, research, and curriculum development, provides a perspective which assists decisionmakers in both the public and private sectors to anticipate the changes in jobs and job skills that can be expected to occur in business and industry. This has greatly improved the level of cooperation between the education/training and industrial communities.

TVA serves as a resource for designing competency-based instruction by staying abreast of new state-of-the-art technological developments. This knowledge is used to assist States and local training agencies to develop curriculums designed to meet specific needs, provide research into education/training deficiencies and new education/training methodologies, provide linkage to international experts for assistance in implementing training programs, and demonstrate and operate new state-of-the-art education/training laboratories, such as the "Factory of the Future" at Chattanooga State Technical Community College. TVA is directly responsible for developing curriculums that are currently being used in a great many of the training activities in the Valley region. From these efforts over 11,000 people were trained and placed in private sector jobs in such areas as automated manufacturing systems, microelectronics, robotics, microprocessors, and customized industrial training techniques.

TVA also assists various agencies and institutions, vocational schools, technical institutes, two-year colleges, State industrial training services, and State and local economic development agencies in coordinating their training activities to improve the matching of job opportunities to labor market demands. These activities are initially provided through working arrangements with certain State and local education institutions for specific periods of time and subsequently become self-supporting through the States and/or the private sector. Such assistance is provided in the form of education/training equipment, qualified instructors, training facilities, and professional aid. Over the past five years, for each dollar that TVA has contributed toward

these efforts, a minimum of \$10 has been contributed by the State and private sector.

Because of TVA's broad perspective and wide range of capability, it has the flexibility to develop innovative education/training pilot demonstrations for use by State and local agencies. These activities are developed through cooperative partnerships with State and local agencies which allow for the sharing of knowledge and expertise and enhances the responsiveness and effectiveness of State and local training programs. As a result, more Valley States are placing a greater emphasis on improving their skills training efforts.

18. Question: Please detail commercial and industrial developments surrounding the Tellico Dam and Reservoir that have been stimulated by its completion. Please discuss the economic effects of the project.

Answer: The Tellico project is a multipurpose resource development project which is located in Loudon, Monroe, and Blount Counties in east Tennessee. A major objective of the project, in addition to the primary purpose of flood control, power production, and navigation, is development of the reservoir shorelands to make the maximum possible contribution to the economy of the region. The three-county project area previously had a very low per capita income, high unemployment, and limited industrial-related job opportunities. In combination with the reservoir, these shorelands now provide prime industrial sites and land for recreational and residential development. To facilitate the accomplishment of these development objectives, TVA identified and acquired shoreland suitable for these purposes.

The construction phase of the Tellico Dam project was completed in November 1979 at a cost of \$137 million. During the period of planning and construction of the project, TVA, other Federal agencies, and units of State and local government cooperated to plan for land use development surrounding the reservoir. A general land use plan was adopted which provided for about 5,000 acres of residential development, 5,000 acres of industrial development, and 3,000 acres of public use and commercial recreation development, and which reserved 9,000 acres for wildlife management, open space, and reservoir operations.

TVA worked with local governments in the three-county project area to begin early phases of the shoreland development process: a two-county regional water system was constructed, development of a county industrial park was begun, and a public port project was planned. As planning progressed, it was determined that long-term implementation of the major economic development aspects of the project could best be accomplished through a locally controlled development organization. Some aspects of shoreland development are still being carried on through cooperative efforts between TVA and individual local governments and other organizations.

In the spring of 1982, at the request of local elected officials and other interested citizens in the three-county project area, the Tennessee legislature established the Tellico Reservoir Development Agency (TRDA) as an agency of the State and authorized it to cooperate with TVA in managing and developing Tellico Reservoir shorelands. Later that year TVA and TRDA entered into an agreement providing for future development activities in accordance with designated land uses and strict development standards.

TRDA has thus far purchased from TVA about 11,000 acres. Of the remaining 22,000 acres of shoreland controlled by TVA, 6,000 acres are reserved for reservoir operations, 700 acres have been sold or optioned to Monroe County for an industrial park, 900 acres have been acquired by the State of Tennessee for a State park, and 47 acres have been acquired by the Eastern Band of the Cherokee Indians for development. About 3,000 acres are currently being considered by TVA and the State of Tennessee for use as a wildlife management area.

TVA has participated in further project development by providing technical advice and assistance in conjunction with local efforts. Since impoundment of the reservoir in November 1979, the following specific commercial- and industrial-development-related investments and activities have occurred.

Infrastructure--Industrial access roads and two industrial waste treatment plants have been constructed by TRDA and Monroe County to serve the industrial area. Natural gas service has been established by the local gas company and two electric service substations have been constructed by local utilities. Rail service lead tracks have been constructed.

Industrial--Three industrial plants have been constructed and are currently in operation. A fourth plant is under construction. Two firms have already expanded their physical plant or facilities. A general office and laboratory building has also been constructed and is being marketed for industrial use. The private investment in these plants and facilities is over \$28 million. More than 700,000 square feet of manufacturing space have been built. Currently about 460 people are employed by these firms. The companies expect to employ over 1,100 employees as they reach full production within the next 18 months.

Tellico Port--A \$1 million public use commercial barge terminal and railroad spur has been constructed by TRDA. Funds for this project were provided by TVA, TRDA, and the State of Tennessee. A private firm operates the port facilities for TRDA.

Residential--TRDA has selected a major private development corporation to develop a 4,600-acre planned residential community. The firm plans to invest about \$40 million in infrastructure development. Another \$600-\$700 million is expected to be invested over 25 years in housing and other facilities. Approximately 9,000 homesites will be developed. The developer estimates that, when completed, the project will provide 600 direct jobs and 1,200 indirect jobs.

TRDA has also entered into a preliminary agreement with another firm to develop a moderate-income retirement residential area which will feature basic health care alternatives to the residents. This \$12 million project is still in the planning stage.

Commercial Recreation--TRDA manages two overnight campgrounds, two beach and day-use areas, and 12 boat launching ramps. A privately operated boat refueling station is now operating on the lake. The Eastern Band of Cherokee Indians is planning to develop a museum and related facilities on the reservoir in memorial to Chief Sequoyah. TRDA is currently reviewing a proposal from a private developer for development of a major commercial marina and resort complex. The proposal for development includes food service, motel, golf course, cabins, and other amenities associated with a complete resort. The developer initially plans to invest about \$7 million. When complete, the resort will produce 50 direct jobs and about 150 indirect jobs.

Other Activities--The town of Vonore is developing a city park on the reservoir. The State of Tennessee has established an 843-acre State Park on Tellico Lake. TVA is considering a request from the Tennessee Wildlife Resources Agency for use of about 3,000 acres for a wildlife management area and refuge. The State will make road improvements and other capital investments to enhance the wildlife population.

19. Question: TVA economic development programs have received some criticism in the past for not adequately addressing the problems of the hard core rural poor in the Valley. Please respond to these criticisms.

Answer: There are many rural areas in the Tennessee Valley region where the per capita income is below 50 percent of the national average and where the majority of the people are below the nationally prescribed poverty level. These areas are, for the most part, geographically isolated, economically distressed, and characterized by low levels of public services and educational attainment. TVA devotes a significant portion of its resources to demonstrating solutions to the problems of the rural poor. Although carried out only in the Valley region, these demonstrations have application nationally. The following examples show how various TVA programs address the problems of rural communities and the rural poor.

Job Creation--The special opportunities counties and cities program (SOCC) was developed specifically to address problems of jobs in the private sector for the hard core rural poor in the Tennessee Valley region. It was immediately recognized that significant amounts of resources as well as innovative approaches would be required to assist these low-income areas. Investment strategies, prepared in partnership with local leaders, guide the development of projects that directly lead to jobs or raise personal income. These efforts are designed to take advantage of the existing skills of local residents and existing natural resources to expand existing industry. Unlike certain other federally supported efforts, the SOCC program is designed to establish self-reliance for the local community and not a continuing dependence on Federal assistance. TVA's principal contribution lies in providing technical assistance to local citizens.

Initially the SOCC program was implemented in only seven counties. This was later expanded to the region's 50 poorest counties, among the poorest in the Nation. In these counties, per capita incomes are about half the national average and unemployment levels range from 15-25 percent. The program was specifically established to address the one overriding problem common to these poverty stricken areas--high unemployment and little hope for new jobs. Results of the SOCC program are encouraging: A recent evaluation of the program indicated the program helped create 6,251 jobs from July 1979 to the present. This translates to about \$1,100 of TVA contributions per job, which is a fraction of the investment of other Federal job creation programs. For the same period, 21 percent of these total job creation expenditures were contributed by the SOCC program, 18 percent by local public contributors, and 61 percent from private financing. Another important feature of job creation in SOCC counties is the employment of persons receiving unemployment compensation and/or other transfer payments. It is estimated that for every person hired who was previously receiving public

assistance, \$3,000 annually is saved and, equally important, the individuals begin to generate tax dollars.

Rural Community Organization and Leadership Development—Poor rural areas are often without established, well-funded developmental efforts or have simply been bypassed in the delivery of conventional assistance from various Federal and State agencies. As a result, traditional types of technical assistance are often inappropriate because the local mechanism to use the assistance may not exist. TVA develops local capacity for self-help by assisting residents of rural communities organize, identify their own particular resources and capabilities, and structure appropriate development projects.

Rural Enterprise Development—In recent years, TVA has put increased emphasis on supporting the growth of small rural businesses. In 1983 technical and other assistance were given to more than 380 small businesses, which account for a significant share of the jobs growth in the region. Improving the region's business climate by providing technical, management, and contract procurement assistance to the small business sector will remain an important goal for TVA in the 1980s. For example, TVA provided technical assistance to Roane Mountain Manufacturing, the only manufacturing business in the isolated upper east Tennessee community where it is located, enabling expansion of the production of remanufactured auto parts. The company was provided a business expansion plan and was leased some surplus TVA equipment to increase production capability. As a result of TVA assistance, a rural business was stabilized and new jobs created in a county experiencing unemployment rates of over 20 percent.

Agricultural Development—Many of the rural poor in the Valley region and across the Nation are full-time farmers or depend on farming for essential supplemental income. TVA has several programs to help generate additional income from small farms and to encourage the growing of home gardens to improve nutrition and supplement the incomes of the poor.

TVA conducts a program to introduce high-income enterprises on small farms. Major emphasis is on developing market opportunities for small farmers for the production and sale of vegetables, fruits, Christmas trees, and ornamental shrubs. These enterprises can generate over \$1,000 per acre in income for individual farmers and have collectively provided millions of dollars of supplemental income to small farmers, many of whom were or are below the poverty threshold.

TVA works in partnership with the land-grant universities, USDA agencies, State and local public and private organizations, and farmers. A collective approach is followed to identify problems to be solved and opportunities to be developed, and to conduct demonstration programs aimed at common goals. The multiagency approach to development has proven to be effective and efficient, and is being used both nationally and internationally.

TVA is also working with about 12,000 rural poor residents, the elderly, and the disabled in sponsoring self-help home garden demonstrations. For a \$30 investment in seeds, fertilizers, tools, and other supplies, each home garden demonstration is producing about \$600 worth of food that is used to improve family nutrition and generate income from sale of surplus production. The land-grant universities, churches, community development agencies, and other public and private organizations cooperate and contribute funding to this program. This approach, if used across the Nation, could go a long way toward alleviating hunger and achieving balanced nutrition among the poor. It lends itself well to voluntarism from church and civic groups.

Infrastructure--Deficiencies in water supply, wastewater, and solid waste management services in rural areas are significant and their impact on the rural poor is substantial. Lack of adequate infrastructure in rural areas minimizes the potential for job opportunities and economic growth. Many small communities lack basic public services necessary to protect public health. Small, low-income communities lack the financial capacity to finance development of water, wastewater, and solid waste management systems. Even with substantial loan/grant assistance from Federal and State sources it is often difficult to establish services at user rates that will be affordable to residents of these communities. TVA assistance assured that all alternatives to significant capital investments have been pursued prior to communities undertaking these expensive projects. Frequently, solving problems in adequate operation and management of existing facilities proves a satisfactory remedy. Operator training and proficiency improvements are an all too common need in small communities which can drive up current costs and render even new facilities inefficient and ineffective.

TVA efforts in addressing community services problems of poor rural communities emphasize development and application of small-scale, appropriate technologies that are carefully designed to avoid unnecessary capital expenditures, to reduce costs to consumers, and to improve service to the public.

Retail trades and services--Small rural communities are often characterized by deteriorating business districts with vacant structures offering few community services or job opportunities, and by a depressed tax base. Rural residents are often forced to drive to adjacent communities to obtain needed services or simply do without some goods and services. In many cases, dollars, jobs, and tax base are lost from rural communities to urban centers. The Townlift program seeks to improve the community viability and livability, as well as the commercial competitiveness of small and medium-sized rural towns. TVA provides technical assistance to local citizen committees in organizing local development corporations, preparing adaptive reuse studies for vacant buildings, developing local small business opportunities, conducting promotion and advertising campaigns for local merchants, and designing physical improvement plans for the downtown. As Townlift works with local leaders and citizens to strengthen the local economy, jobs are produced in the retail, service, and construction sectors, providing opportunities for the rural unemployed and the underemployed. Local public and private funds invested in Townlift projects typically amount to more than five times TVA's cost of technical assistance. In 1984 Townlift investments totaled more than 30 times that of TVA costs.

20. Question: Please list and describe all of the individual projects performed under the Townlift program since 1983. In each case describe TVA's role and financial contribution and the role of other entities (municipal, private, state, etc.) and their financial contribution.

Answer: TVA's Townlift program provides technical assistance directed toward the economic development and revitalization of small towns at the request of local leaders. This assistance includes organizing for development, identifying local economic opportunities through market analysis, planning and providing conceptual design for improvements, identifying funding options, and outlining steps for implementation. Local leaders involve citizens to decide on priorities and develop plans to implement recommendations. Except in rare instances, funding for implementation of projects is a local responsibility. Banks may support the effort by providing low-interest loans. Local governments often provide funds for implementing public improvements, or may request funds from State agencies. Grants, such as UDAG, are used when available to implement some of the major projects in distressed areas.

Highlights of major Townlift projects since 1983 are discussed in the attached report. The expenditures mentioned in the report are non-TVA public and private investments in the implementation of Townlift recommendations. In 1983 TVA's Townlift budget was \$1,333,000; assistance was provided to 42 communities in the region. As a result of this assistance, \$6.1 million in private and public funds was invested in implementing Townlift recommendations. During fiscal year 1984 TVA budgeted \$789,000 for Townlift; a total of \$25 million in public and private funds was invested in Townlift activities in 68 communities. More specifically: 18 new businesses were created and 2 major business expansions occurred; 106 new permanent jobs, mostly in the retail trades and services sector, were created along with 50 construction jobs; low-interest loan pools were created by local banks to support private investment in two Townlift communities; structures, including several large historic hotels, were adapted for housing, businesses, and community activities; and downtown advertising and promotion programs were initiated in several communities. During the first two quarters of fiscal year 1985 TVA's Townlift budget was \$440,000; \$1,755,500 in public and private funds was spent on projects in 32 communities. Sizeable investments are being planned in several communities, including Jamestown, Tennessee, a major entrance to the Big South Fork National River and Recreation Area.

These numbers illustrate clearly how TVA's support of local efforts through technical assistance generates local investments substantially in excess of TVA's budget for Townlift.

TOWNLIFT PROGRAM

PROGRAM HIGHLIGHTS

October 1982 through May 1985

Tennessee Valley Authority
June 1, 1985

Alabama

- o Collinsville (DeKalb County)--The Collinsville Townlift includes developing business recruitment strategies, marketing assistance, and physical enhancement plans for the downtown. The effort is being led by the city and the Collinsville Business and Professional Association. Preliminary marketing studies have been prepared and concept designs are underway. Expected results of local efforts include identifying vacant business buildings and recruiting businesses to fill them, which should lead to the creation of approximately 30 new jobs. Townlift assistance is also being directed towards increasing commercial activities for Trade Day. Private investment has included \$32,000 for the recent renovation of a structure in Collinsville, bringing the total number of renovated business structures to 13. A new dress manufacturing industry has been recruited by the community and the city is building two new parking lots. The dress manufacturer is expected to initially provide 12 new jobs.
- o Florence (Lauderdale County)--Townlift provided follow-up assistance in FY 1985 to three Florence area minority businesses after a minority economic development conference in Florence.
- o Fort Payne (DeKalb County)--TVA staff provided a redevelopment plan for the W. B. Davis Hosiery Mill in Fort Payne. The report included a space analysis, suggested five-phase redevelopment plan, and estimated costs and benefits. A marketing strategy was also outlined. Forms for nominating the building for the National Register of Historic Places were also included.
- o Hanceville (Cullman County)--A meeting was scheduled in January 1985 to discuss a Townlift application. Officials from the city, State, and Federal offices have expressed an interest in being involved in the project. The officials have indicated an interest in business recruitment strategies, marketing studies, and physical enhancement.
- o Huntsville (Madison County)--An initial visit was made to Huntsville in November 1984 to discuss Townlift. The primary concern of interested groups, including Alabama A&M University and the local government, is Spring Branch. Spring Branch originates in downtown Huntsville and flows through commercial and recreation areas to the southwest. The goal of the Townlift is orderly development along Spring Branch. Many jobs are expected to result from the growth in retail shops, office space, restaurants, and tourist attractions.

Townlift assistance was also provided to:

- o Double Springs (Winston County)--Utilized \$213,000 in jobs bill funds to implement public improvements.
- o Guntersville (Marshall County)
- o Hamilton (Marion County)
- o Moulton (Lawrence County)--Invested \$128,580 in Townlift public improvements.
- o Scottsboro (Jackson County)--The Scottsboro/Jackson Heritage Center, begun in FY 1983, was formally opened in FY 1985. A public investment of \$60,000 was matched by private funds and grants, plus many in-kind services.

Georgia

- o Blairsville (Union County)--Staff is assisting the community to revitalize its downtown area, including providing concepts for enhancing existing structures. The chamber of commerce, a local developer, the Georgia Mountain Planning and Development Commission, and the local TVA power distributor are all involved in the Townlift effort. The "Merchants Walk" downtown mall has been developed with four new businesses and 16 new jobs. about one-third of the downtown buildings have been improved. Plans include developing a new small business incubator and completing the "Merchants Walk" development.
- o Blue Ridge (Fannin County)--The goal of the Blue Ridge Townlift is to create a livable and quality community within the downtown area. The focus of the downtown is a restored railroad depot. Project leaders include the mayor, chamber of commerce, the Blue Ridge Improvement Association, the local TVA power distributor, and the North Georgia Area Planning and Development Commission. The Townlift efforts account for 53 new jobs. The depot has been restored, 13 new businesses have opened, and numerous public improvements made to enhance the downtown including improved parking, street landscaping, and new street lights. The final phase of improvements which will extend in 1986 range from developing moderate income rental units to providing an alternate living center for elderly citizens who are in need of only custodial, rather than medical, care. A housing organization was formed in April 1985.
- o Dalton (Whitfield County)--The Dalton Development Authority organized as a result of Townlift serves as a model for the development of similar organizations in other communities. TVA provided \$10,000 to initiate the authority in its first year. The authority is now self-supported by local funds by taxing itself about \$120,000 annually. In addition, it has fostered over \$1 million in improvements in the downtown area.
- o Summerville (Chattanooga County)--Renovations and new construction totaling \$207,000 were completed as a result of Townlift in Summerville. TVA participated with Georgia Power and Light in the project. An additional \$20,000 was invested by the city to improve parking.

Townlift assistance was also provided to:

- o McCaysville (Fannin County)--Provided a development plan and assistance in fund raising projects for a new city park. The park is now under construction, matching a \$75,000 grant from USDA with local, State, private, and an SOCC grant.

Kentucky

- o Benton (Marshall County)--A comprehensive economic growth strategy based on the opportunities afforded by the Land Between The Lakes is underway. The local government and over 50 local citizens have participated in developing projects to increase Benton's share of the tourism dollar. In FY 1985 general economic trends are being determined for the area, and strategies developed for promoting the city. Physical planning to support these

Kentucky (Continued)

strategies is being completed. During the second quarter of FY 1985, \$75,000 was invested in projects, including \$50,000 in public funds to purchase land for the plaza park. In FY 1986 new business opportunities will be identified and business recruitment implemented. The expected results include more than 20 construction jobs and 50 permanent jobs for the citizens of Marshall County and increased tourism.

- o Mayfield (Graves County)--The renovation of the Old Mayfield Hotel is one of the many public and private improvements designed to strengthen the economic base of the community. Renovated private businesses are complemented by improved public sidewalks, parking, and landscaping. The city, chamber of commerce, and over 50 local citizens have been involved in developing and implementing Townlift proposals. After the planning and implementation of physical improvements are completed in FY 1985, an economic analysis to identify new business opportunities will be scheduled in early FY 1986. The projected impact of the projects on employment in Mayfield is an increase of 50 construction jobs and 50 permanent jobs. The city began removing overhead wiring and installing improved exterior lighting at the courthouse in third quarter FY 1985.
- o Paducah (McCracken County)--Paducah has been one of the most outstanding Townlift communities during the past five years. Currently the organization started by Townlift (Growth, Inc.), is developing a riverfront park with Townlift assistance. The plan is to be completed in FY 1985 and implemented in FY 1986. An estimated 40 construction jobs will be created to build the park, and five permanent employees will be needed to operate the marina and maintain the park. Renovations in FY 1983 totaled \$550,000.

Townlift assistance was also provided to:

- o Auburn (Logan County)
- o Morganton (Butler County)--Spent \$85,000 renovating an historic building as a city hall.
- o Wingo (Graves County)--Townlift provided assistance to develop a new industry in the downtown. A total of \$325,000 was invested in Townlift projects.
- o Leitchfield (Grayson County)

Mississippi

- o DeKalb (Kemper County)--Local and State officials are helping create a local business development organization in DeKalb. This organization will pursue business recruitment, improving marketing, and enhancing commercial and office buildings. Basic design recommendations have been provided by TVA for enhancing structures, and some implementation has occurred. Work is continuing on developing an organization which is capable of preparing for and achieving economic growth.
- o Fulton (Itawamba County)--A Townlift workshop was held in Fulton in March 1985 to begin planning activities. Leaders from the city and the Itawamba County Development Council hope to revitalize downtown Fulton, which is adjacent to the Tennessee/Tombigbee Waterway. The Tennessee/Tombigbee

Mississippi (Continued)

Waterway Development Authority and State agencies are supporting the Townlift application. A focus of the effort will be developing strategies to deal with the rerouting of US Highway 78.

- o New Albany (Union County)--Storefront renovations and public improvements totaling \$175,000 were completed in FY 1983.
- o Pontotoc (Pontotoc County)--Short-term technical assistance provided through a workshop in Pontotoc resulted in three building improvements and a total of \$4,500 in private investment.
- o Starkville (Oktibbeha County)--Starkville has been a very active and successful Townlift community. A major ingredient in its success has been the Starkville Downtown Business Association (SDBA) which was initiated by Townlift and now has a full-time director. The director's salary is paid by local businesses. Local bank support has provided a pool of low-interest loan funds to support Townlift renovations. Business recruitment activities are a major focus of SDBA. TVA also provided assistance, as needed, for the redevelopment of the historic Stark Hotel.
- o Water Valley (Yalobusha County)--The downtown businesses invested \$1,000 in new trash containers as a part of beginning Townlift.
- o West Point (Clay County)--A Townlift presentation was made in West Point in October 1984. The West Point Chamber of Commerce has lead efforts to cope with the closing of two major downtown retail stores. Sixty new jobs have already been created.

Townlift assistance was also provided to:

- o Houston (Chickasaw County)
- o Oxford (LaFayette County)
- o Senatobia (Tate County)

North Carolina

- o Asheville (Buncombe County)--A \$16.1 million Townlift focusing on development of minority businesses in the South Park Square area began implementation in the fall of 1984. A \$14 million UDAG supported the project which is expected to generate almost 400 jobs.
- o Banner Elk (Watauga County)--A visual survey has been conducted to identify problems and opportunities in design, land use, and economic development in the downtown. Concepts for development will be provided and assistance for specific projects as requested by the local community. The community is attempting to gain some control over the land development process in a town where property values have tripled in the past few years, mainly due to the rapid growth of the ski resort and retirement sectors.
- o Black Mountain (Buncombe County)--The Black Mountain Townlift is a new business development initiative which includes: identifying product and service

North Carolina (Continued)

voids, as well as local and external resources to fill the voids; preparation of business expansion and recruitment strategies; development of specific private sector projects and proposals based on these strategies; technical analysis or development proposals; and assistance in promotion activities. Local industry leaders, the chamber of commerce, North Carolina Department of Transportation, Carolina Power and Light, and the Land of Sky Regional Council are participating. Local businesses have already invested \$585,000 in expanding and renovating existing businesses; this activity resulted in 11 new businesses, 4 major business expansions and an additional 19 new permanent jobs and 47 construction jobs. The city invested \$50,000 in public improvements. Other projects generating additional local employment should be underway in FY 1985 and operational by FY 1986.

- o Boone (Watauga County)--A concept design was provided for a \$100,000 adaptive reuse of an old bank building as a tourist welcome center, chamber of commerce offices, and headquarters for the High Country Host organization. Funds have been secured.
- o Canton (Haywood County)--Canton has completed a number of public improvements, including improved sidewalks, parking, and a downtown mini-park.
- o Maggie Valley (Haywood County)--The mayor of Maggie Valley recently praised the Townlift program and noted that "Economic benefits to the community have been dramatic." An application has been received for a study of the conversion of an abandoned elementary school into a multipurpose community facility. The mayor and city manager are interested in reuse of the facility. If the application is approved, the study could begin in FY 1985 and implementation could occur in late FY 1985 and early FY 1986. A major Townlift project--a \$500,000 shopping center--was completed in FY 1984. In FY 1983, \$750,000 in Townlift improvements were completed, including a community multipurpose center.
- o Sylva (area) (Jackson County)--The communities of Sylva, Dillsboro, Cullowhee and Webster are cooperating in a Townlift effort aimed at strengthening the local economies. A nonprofit development corporation, Mountain Pride, Inc., has been formed to help pursue specific projects. Local business leaders and Western Carolina University's Center for Improving Mountain Living are supporting the Townlift. A situation assessment is being prepared with assistance from WCU.

Townlift assistance was also provided to:

- o Robbinsville (Graham County)--Invested \$15,700 in public improvements.

Virginia

- o Abingdon (Washington County)--The city of Abingdon is applying for a \$750,000 UDAG to construct the intown bypass and other prepared improvements. Abingdon has already implemented an expansion of the historic Barter Playhouse with grants from the National Trust for Historic Preservation and the National Endowment for the Arts, which were matched by local funds. Two

Virginia (Continued)

train depots and several commercial buildings have also been renovated. Total investment in Townlift projects in Abingdon has now reached \$321,920.

- o Appalachia (Wise County)--At the end of the first quarter of FY 1985, a total of \$4.2 million had been invested in Townlift projects in the city of Appalachia. Of that amount \$1.7 million is public investment, including a UDAG grant, while \$2.5 million was invested by the private sector. Appalachia's experience was featured as a model downtown redevelopment effort at a meeting of the International City Management Association. Twenty-four buildings have been renovated in the downtown; twenty-three of the buildings house new expanded or improved businesses. One of the businesses is the town's only pharmacy and adjacent medical clinic. The nine new businesses which were developed resulted in 45 new jobs while construction provided 58 jobs. Many jobs were provided by a new supermarket.

Tennessee

- o Benton (Polk County)--The focus of the Benton Townlift is the adaptive reuse of an unused public school as a motel to spur local economic development. The Polk County School Board, Polk County Commission, Tennessee State Planning Office, local banks, and the local TVA power distributor are cooperating in the project development. A preliminary design evaluation of the building is complete; the evaluation indicates that the reuse is feasible. A market analysis is underway to test the economic feasibility of the project. If the market feasibility is favorable, efforts will be made to assist local leaders to find a prospective tenant. If the motel is developed, it should generate about \$200,000 for the local economy and provide four new permanent full-time jobs.
- o Chattanooga (Hamilton County)--Working with the East 9th Street Economic Development Corporation and the city, staff are developing a business recruitment strategy and a promotion and advertising plan for the M. L. King Boulevard. A physical enhancement plan and an energy demonstration keyed on the adaptive reuse of older commercial structures is also being provided to the property owners and merchants of this minority business area.
- o Jamestown (Fentress County)--Jamestown is developing as an outstanding Townlift project. The community is planning for the expected benefits, especially an increase in tourism income, from its position as a major entrance to the Big South Fork National River and Recreation Area. Each Townlift project is designed to strengthen Jamestown's role as a gateway community. Chaired by the chamber of commerce executive director, the Townlift Committee is a joint effort of the city, county, planning commission, and local businesspeople. Over 100 local citizens have been involved in the monthly Townlift meetings. Planning for 15 local economic development projects, ranging in scope from the large Ledbetter Farm and Apple Orchard Center to individual stores recommended for new businesses, will be completed in FY 1985. Over 200 construction jobs and 200 permanent jobs are expected in implementation of the projects in FY 1986. These projects will serve the 2,000,000 tourists projected for the Big South Fork area. Recent implementation includes a \$25,000 renovation of a flower shop and a \$50,000 renovation of a large downtown building.

Tennessee (Continued)

- o Kingston (Roane County)--City leaders in Kingston are interested in developing a theme for the community to attract additional tourists. The University of Tennessee School of Architecture is providing design assistance under a contract with TVA to the chamber of commerce, Roane County Historical Society, and local banks. Tennessee State Planning Office is also providing assistance. TVA provided a concept design for adaptive reuse of a portion of the historic Roane County Courthouse to be used as a bank. Current plans include investigating motel and marina development. The theme is expected to provide a visual "sense of place" for the downtown and enhance it as a tourist locale.
- o Knoxville (Knox County)
 - Staff have developed a demand responsive public transit service for Knoxville to connect high density residential clusters to business, recreation, work, medical, learning, and shopping generators. A funding application has been submitted to the Urban Mass Transit Administration; the UMTA staff has recommended the proposal for funding. The mayor, the Knoxville Transportation Authority, Citizens Advisory Committee on Public Transportation, and the Amalgamated Transit Union have all been involved in developing the project and have endorsed it. TVA will have the lead role in design of the system and its evaluation. The City of Knoxville will operate the demonstration. A successful teletransit system could replace lightly used traditional transit routes with a more flexible alternative. The net result is reduced operating costs for local transit operations and enlarged markets for increased ridership. Such a system could be replicated in medium-size metropolitan areas nationwide.
 - Plans are underway for the adaptive reuse of the historic Southern Railway station for an intercity bus terminal. The mayor, a private architect, representatives from Greyhound and Trailways bus lines, and the Knoxville Transit Corporation are all involved in planning the transportation center. The preliminary layout for site redevelopment has been completed by the consultant and reviewed by TVA and bus company representatives. The adaptive reuse of the historic depot will cost in excess of \$1 million in private investment. A major bonus will be consolidation of services to provide improved transfer of passengers from system to system, and reduced operating costs for the companies.
 - To assist the city with the economic revitalization of Mechanicsville (a black minority area), staff are assisting with a revitalization plan for the commercial district and studying the reuse potential for an abandoned grammar school. Partial funding (\$10,000 in FY 1985) has been committed to support a full-time economic development director for the area.
- o Livingston (Overton County)--Public improvements consisting of curb extensions, new sidewalks, traffic redesign, and landscaping are being developed for downtown Livingston. These improvements will strengthen Livingston's ability to solicit new businesses for the area, once TVA has helped identify new business opportunities. Leaders from the city, county, chamber of commerce, and more than 30 local citizens have been involved in the Townlift projects. Designed improvements are to be completed in FY 1985 by both the

Tennessee (Continued)

city and adjoining private property owners. New business opportunities will be identified in FY 1986. Current estimates are that the Townlift will create 20 permanent jobs and 20 construction jobs.

- o Manchester (Coffee County)--The mayor of Manchester chairs the local Townlift Committee which also includes a member of the planning commission. Downtown revitalization is the focus of the Manchester Townlift effort, and the city plans to implement plans for street improvements, new sidewalks, landscaping, and offstreet parking in late FY 1985 and early FY 1986.
- o Mount Pleasant (Maury County)--A Townlift in Mount Pleasant focused on the development of a new \$500,000 city hall complex.
- o Newport (Cooke County)--Two Townlift projects completed in Newport are the \$35,000 renovation of a retail clothing store and the investment of \$90,000 in public and private funding in the renovation of the downtown shopping center. The city has allocated \$50,000 to fund public improvements which are being developed by Tennessee Department of Transportation and the city's consultant.
- o Upper Cumberland (Jackson, Overton, Putnam, Smith, Fentress, White, Warren, Cannon, Rutherford, and Cumberland Counties)--Plans have been completed and commitments secured for demonstrating an interline rural transit with intercity bus service at new bus terminals at rural interchanges. The Tennessee Department of Transportation will provide shuttle vehicles for the 10-county demonstration area. The University of Tennessee Transportation Research Center, Upper Cumberland Rural Transit Operator, Greyhound, and Trailways have agreed to participate. The demonstration is scheduled to be underway in 1985. The concept has been presented to the Transportation Research Board in Washington, D. C., and documented in a publication, "Use of Rural Paratransit to Interline with Greyhound and Trailways in Tennessee." A successful demonstration is expected to result in an immediate extension of the concept Statewide and potentially nationwide by both Greyhound and Trailways, who see the concept developed by TVA as a means of continuing intercity bus service to rural areas.

Townlift assistance was also provided to:

- o Collierville (Shelby County)--Invested \$25,000 in Townlift public improvements.
- o Dunlap (Sequatchie County)--\$30,000 was invested in Townlift projects.
- o Halls (Lauderdale County).
- o Hohenwald (Lewis County)--Invested \$20,000 in downtown parking improvements.

21. Question: How many land use plans has TVA completed for its reservoirs? How much have they cost? Please detail how they are or will be used. How many more land use plans are planned? Are these plans put together by TVA employees or are they contracted out? How do the cost of these plans compare to the costs of similar land use plans contracted for by the Corps of Engineers?

Answer: Historically, TVA planning along its reservoirs has been limited and relatively informal. Some designations of current and potential sites for power- or recreation-related facilities were made but comprehensive assessments were not prepared. In more recent years the increasing competition for shoreline by residential, commercial, industrial, recreation, wildlife, and transportation interests, both public and private, made it imperative that a more responsive, cost-effective, and manageable process be implemented on selected reservoirs.

Since 1980 TVA has developed plans for three Tennessee River mainstream reservoirs: Pickwick, Guntersville, and Kentucky. Planning for Watts Bar Reservoir is underway and should be completed in 1986. TVA intends to develop management plans for all seven navigable mainstream reservoirs and one tributary reservoir. The total cost for the three completed reservoir management plans was about \$1.5 million.

Each plan sets forth TVA's strategy for the use and management of fee lands on a particular reservoir for the next 10 years. Possible land uses considered in the plan include: commercial or public recreation, industrial site development, port site development, forest resource management, historic and archaeological site protection, agricultural development, critical plant or animal habitat protection, wetland and floodplain protection, cooperative wildlife management areas, visual resource management, and public service projects. The plans serve as an inventory and policy guide for administration of all TVA property rights.

Reservoir plans and their supporting data also serve as public information documents and increase TVA's ability to respond promptly to public requests for use of its lands.

By planning for future use:

- costly delays due to environmental review processes can be lessened,
- potential controversy over use of TVA land is identified through public involvement during plan development and resolved to the maximum practicable extent,
- feasibility studies and expenditures by private sector industrial developers considering projects in unacceptable locations can be avoided, and

--conflicting uses of adjacent private land on reservoir shorelines are minimized.

The reservoir plans are developed by an interdisciplinary team of TVA employees with extensive opportunities for review and comment by State and local governments and the general public. Economic, social, environmental, and natural resource data about the TVA lands and adjacent reservoir area are assembled and interpreted by staff familiar with the data and the particular geographic area.

We understand that master plans developed by the U.S. Army Corps of Engineers for their lake projects differ in content, scope, and level of detail from those currently being developed for TVA reservoirs. Corps master plans are generally designed to aid in the planning, development, and use of the recreational resources of a specific Corps project. Land use designations are generally less detailed and the natural, social, and economic data assembled during master plan development is often not as comprehensive as that for TVA reservoirs.

According to representatives of the Corp of Engineers, Nashville District, most work currently being contracted for includes updates to original master plans developed for Corps projects in the Cumberland River drainage area. These master plans were developed in-house by Corps staff between 1940 and 1960. Contracted portions of updates to these plans cost about \$100,000 each and rely heavily on existing information.

In other Corps districts, both master plans and updates have recently been done in-house or under contract, depending upon field-level capability, work load, and project type. Land uses addressed in Corps master plans are often limited to intensive or low density recreation, wildlife management, or reserve forest lands. In contrast to Corps plans, TVA reservoir plans address specific land capability and suitability for the wide number of land uses listed earlier.

22. Question: How much land has TVA purchased for Columbia Dam? If the dam is not completed, will TVA dispose of that land? If so, how? What will become of the partially completed dam?

Answer: TVA has purchased about half of the 27,500 acres of land required for the dam and reservoir. This land could be disposed of in a number of ways, ranging from transfer of landrights to the State or counties for possible recreational development, to sale at public auction. TVA would recommend that prior to any decision a study be made to develop and assess disposal options.

As with disposal of purchased land, TVA would recommend that a study of all options be conducted prior to any decision on the partially completed dam if Congress decides not to complete it. Should Congress decide not to complete Columbia Dam, the earth-fill portion of the dam would have to be removed to allow passage of floodwaters. The concrete section could possibly remain.

23. Question: Please explain the ways in which TVA can influence or control various types of development along its reservoir's banks.

Answer: Under the TVA Act, all property acquired by TVA in the name of the United States is entrusted to TVA as the agent of the United States to accomplish the purposes of the TVA Act. TVA acquires such land and landrights as may be necessary to ensure that TVA has sufficient rights to operate its dams and reservoirs for the purposes for which they were constructed, including navigation, flood control, power generation, recreation, and industrial and economic development. These lands and landrights are then managed by TVA in accordance with the purposes for which they were acquired.

For effective administration of reservoir properties, a ready source of authoritative information is needed to show the uses for which properties appear best adapted in furtherance of TVA's objectives. To meet this need, TVA has developed land use plans for three of the seven Tennessee River mainstream reservoirs and intends to complete plans for all of them and one tributary reservoir. The detailed information contained in these plans, which are developed after public review and comment, is then used to guide future administration and development of specific tracts. On other reservoirs, less formal and less detailed assessments of shoreline lands have been conducted to help ensure that future development is compatible with surrounding uses and consistent with TVA program requirements.

TVA also determines when and to what degree interests in real property in its custody are no longer needed by TVA for its authorized projects. As agent of the United States, it disposes of interests in real property in such ways as it determines will contribute to the achievement of TVA program objectives or otherwise further the public interest and not be adverse to the interests of the United States by including such covenants and restrictions in the transfer instrument as TVA deems necessary.

In addition to managing its own lands to further the objectives of the TVA Act, TVA also influences uses of other lands through technical assistance to industries, individuals, and State and local governments. Through its natural and economic resource development programs, TVA influences the type and quality of development by public entities and the private sector. Such development may include recreation improvements, ports, and forest products marketing. Using its specialized expertise, TVA provides technical advice and assistance on water quality impacts, erosion and sediment control, flood protection, and other environmental matters.

In order to provide for the unified development and regulation of the Tennessee River system, Section 26a of the TVA Act provides that no dam, appurtenant works, or other obstruction affecting navigation, flood control, or public lands or reservations may be constructed, operated, or maintained along, across, or in the Tennessee River or any of its tributaries unless TVA approves the plans for such construction. Under this authority TVA reviews plans for virtually all water use facilities to be constructed in the Tennessee River system, including boat docks, piers, boat-houses, rafts, boat launching ramps, and nonnavigable houseboats.

24. **Question:** Please describe in some detail and give some examples as to how TVA balances the often conflicting demands on its reservoir system (recreation vs. flood control; hydropower vs. water quality, etc.). Are these decisions and subsequent actions sometimes controversial? To what extent has public reaction modified TVA's operation of the reservoir system?

Answer: Dealing with conflicting demands on the TVA reservoir system has become an increasingly difficult task, as the population of the Tennessee Valley has grown and the interests of the people have diversified. Under Section 9a of the TVA Act, TVA must regulate the streamflow primarily for the purposes of promoting navigation and controlling floods, and, so far as may be consistent with such purposes, for generating electric energy. All other reservoir operation programs must be carried out consistent with these purposes. As the demands increase, TVA continues to examine its operations to find ways of providing additional benefits within the statutory provisions on TVA's operations.

Navigation depths and minimum streamflow requirements must be maintained along the mainstream of the Tennessee River and at certain other locations in the region. During the winter and spring, flood control is the major consideration in the operation of most TVA reservoirs. The need for flood storage capacity also affects lake levels in late summer and through the fall as a slow drawdown is scheduled. Power demand, particularly in winter and summer peak use periods, is a major factor affecting the rate and pattern of water use. Consistent with the primary purposes for which the dams must be operated, mosquito and weed control are considered in certain special and cyclic operations affecting lake-level manipulation. Water flow within the TVA system is already closely regulated and no obvious opportunities are present to free up water without affecting required operations. TVA has been working on a reservoir reevaluation initiative as a part of reservoir system operations since 1984, and operating requirements using improved computer modeling techniques are being reviewed in an effort to improve the efficiency of the system and increase operating flexibility margins. Wholesale operating changes are not expected but incremental improvements are likely.

The resolution of conflicts with finite resources is by no means an easy or simple job, and often no one is totally satisfied. Many of the toughest decisions center around special, but entirely legitimate, economic interests. Where recreation and tourism are closely related or fishing and wildlife interests make up significant tourist attractions, conflicts can arise for both flood control and power generation. Commercial and private property development around reservoir shorelines also creates conflicts with the primary purposes of navigation, flood control, and power production.

Such conflicts inevitably open the way for controversy. This is especially true where there is a strong drive on the part of

local residents for special consideration in the operation of what they consider to be "their" reservoir. Blue Ridge Reservoir in north Georgia and Fontana Reservoir in western North Carolina are prime examples of lakes built as major power or flood control projects where strong pleas have been made for special lake levels in the interest of tourism and economic development. But they are not unique. Similar requests have been received for special operations at just about every reservoir in the TVA system.

Water quality considerations conflict with power interests in connection with TVA efforts to improve the oxygen content of water discharged during hydroelectric production. Introduction of air into the reservoir reduces power production efficiency. The cost is generally low to moderate but must be recognized. Lake stabilization for fish spawning and lake level fluctuation for mosquito control can conflict with a number of other uses, including power production and the desires of property owners for stable lake levels around a reservoir. Special drawdowns for dam or power plant maintenance or for weed control may conflict with fishing or recreation interests.

The public has a strong influence on some aspects of reservoir operations. For instance, in the early 1970s operating guides for most tributary reservoirs were adjusted within the constraints of the TVA Act to more readily ensure spring filling to desirable recreational levels. Maintenance or other special drawdowns often are planned with consideration for the interests of property owners and lake users. For example, TVA is now considering a recent suggestion that, in controlling mosquitoes, alternate mainstream lakes be filled on weekends one year and lowered the next, instead of the current schedule under which the level of a given reservoir may consistently be altered every weekend. In order to ensure that the public has an opportunity to present its views on significant matters, public meetings are often held when a significant change in operation of a reservoir is contemplated. TVA will continue to consider all requests for changed reservoir operations within the constraints of the primary purposes for which the reservoirs must be operated.

25. Question: Please furnish materials which describe TVA's involvement in tourism promotion for the Tennessee Valley area. Include in these materials estimates of TVA's expenditures on promotion of tourism.

Answer: The primary thrust of TVA's \$250,000 tourism effort in fiscal year 1985 is two-fold. First, technical assistance is provided to help communities assess the local potential for tourism development, provide plans of action and market assessments, and organize local tourism promotion organizations. Second, research is conducted by TVA on the economic impact of the travel industry in the region, and this information is provided to interested persons and organizations throughout the region to assist in their future tourism development efforts.

TVA does not promote specific tourism attractions in the Tennessee Valley region; this is a role which requires substantial resources and is performed by Valley States and the private sector.

26. Question: Please provide a detailed breakdown of the Land Between The Lakes capital improvements and facilities, and operations budget for FY 85 and for TVA's proposed FY 86 budget. Also, please describe each individual program item in the LBL budget.

Answer:

<u>Program</u>	<u>Fiscal Year 1985 Obligations (In Thousands of Dollars)</u>
<u>Operations</u>	
Natural resource management:	
Forest management and improvements.....	368
Forest fire control.....	58
Maintain open lands for wildlife feeding, viewing, and habitat management.....	130
Fish/water resource development.....	157
Wildlife management/controlled hunts...	513
Integrated tick research/control project.....	94
Subtotal.....	<u>1,320</u>
Recreation, interpretation, and environmental education:	
Youth Station operation/environmental education programs.....	673
Resource/historical interpretation.....	1,074
Family campground operation/programs...	742
Troup camp operation/programs.....	723
Operation of undeveloped camping and lake access areas.....	245
Subtotal.....	<u>3,457</u>
Support operations:	
Compliance inspections of water/ sewage systems.....	94
Solid waste collection and disposal....	136
Protection of visitors and property (law enforcement).....	907
Maintenance of roads and trails.....	825
Larvicide and insect control.....	14
Public services/visitor reception/ information.....	659
Mowing for beautification and protection.....	68
Maintenance of support facilities, equipment, and grounds.....	755
Subtotal.....	<u>3,458</u>
Total operations.....	8,235

<u>Program</u>	<u>Fiscal Year 1985 Obligations</u> <u>(In Thousands of Dollars)</u>
<u>Facilities</u>	<u>90</u>
Total obligations.....	8,325
Revenue.....	-1,075
Total appropriations.....	<u>7,250</u>

Fiscal Year 1985:

Land Between The Lakes operations support an array of visitor programs and activities which enable LBL to fulfill its unique mission. Over 6,300 annual activities and programs are designed to benefit individuals, families, and large groups. Operation and maintenance of support facilities, including education centers, roads, campgrounds, group camps, and visitor centers, are vital to program success. Special attention is given to protection, orientation, access, and general administration to ensure a safe and beneficial experience for the casual visitor as well as visitors seeking to improve professional skills. Also included as a part of LBL operations is the functional responsibility for maintenance of reservoir lands and activities that fall within the boundaries of LBL.

Natural resource management activities include management of the 150,000 forested acres and 20,000 acres of open land as an integral part of LBL's comprehensive resource management plan. About 21,000 acres of forest land are inventoried and management plans prepared. Timber is marked and harvest operations conducted on 3,000 acres. Timber stand improvement is performed on 300 acres following group selection harvest. Activities include wildlife habitat improvement and an expanded educational and training program, which are designed to increase LBL's appeal to wildlife viewers and other users. Special management efforts on six areas for enhanced waterfowl viewing and hunting and on two areas for improved small game hunting are conducted. Ten managed hunts are also conducted. Bald eagle and osprey restoration projects are cooperatively conducted with private groups and with State and other Federal agencies. Natural resource management objectives and techniques are presented to the public through consortia, public meetings, field days, and professional training workshops. An interagency project directed toward research and control of LBL's serious tick infestation is being continued through testing new chemical spray equipment, evaluating integrated pest management practices, and investigating select biological control measures (e.g., tick habitat and animal host manipulation). Fifty miles of log and skid roads are being refurbished, and contracts with the States of Kentucky and Tennessee for forest fire protection are being continued. About 1,200 acres of open land are

maintained by controlled burning, soil disturbance, or mowing, and about 5,000 acres are farmed under cooperative farming contracts, providing income for local farmers, wildlife habitat, and viewing opportunities for visitors.

Environmental education, resource interpretation, and recreation provides outdoor recreational and educational opportunities for over 2 million visits a year. The 5,000-acre Environmental Education Area includes Youth Station Group Camp, study areas, day-use areas, and 11 miles of trails. Last year there were 7,500 overnight visits by students and teachers from 14 States participating in two- to five-day resident programs. Preservice and inservice seminars and workshops provide training to over 2,000 teachers, administrators, and program professionals. The environmental education program reaches groups from more than 20 States and 7 foreign countries. The Homelace-1850, Empire Farm, Woodlands Nature Center, and the Golden Pond Visitor Center serve more than 310,000 general visitors. Educational activities at these facilities are provided in 4,000 daily and evening programs and 7 special events for 125,000 of those individuals. Innovative programming directed toward attracting and creating environmental sensitivity in 700 groups should increase use at Camp Energy and Brandon Spring Group Camps to 45,000 overnight visits. The expanded Piney Campground (increased from 200 to 400 sites) is being operated for its first full year. Rushing Creek Campground continues to evaluate operations under a new cost-effective management approach. These efforts are increasing family campground use by almost 20 percent to about 260,000 visitor-days. Recreational opportunities for over 80,000 campers and 500,000 day-use visitors are provided at 27 informal-use and lake access areas.

General support operations provide routine maintenance of 368 miles of roads and 50 miles of trails. Resurfacing of 3.4 miles of roadway is being conducted. The five interior LBL subimpoundments are maintained. All water and sewage systems are tested in accordance with State and Federal regulations. Mosquito habitat is treated, and spraying of approved pesticides for insect control is conducted on 300 acres. LBL is publicized and marketed through the efforts of over 300 writers and onsite tours for about 200 groups. Three information centers, providing information to about 100,000 registered visitors, are operated. Property protection and law enforcement for all LBL facilities, roads, and visitors is provided. Two entrance control stations are operated to provide security and control.

Land Between The Lakes facilities are limited to the purchase and replacement of portable equipment used in the operation of LBL.

Fiscal Year 1986:

TVA had initially requested funds for LBL's fiscal year 1986 budget based on maintaining the same level of activity as in fiscal year 1985. However, the President's budget for fiscal year 1986 provides no funding for facilities or operations of Land Between The Lakes and presumes some other entity, public or private, will assure responsibility for TVA. TVA is unaware of any willing or capable alternative sponsor at this time. Should no transfer be forthcoming at the beginning of the new fiscal year, TVA will be forced to request the use of other remaining TVA program funds to close and protect the facility.

27. Question: What percentage of the 2 million annual LBL visitations come from outside the Tennessee Valley area? Does that 2 million figure include day visits by school and other day groups (scout troops, etc.)? If so, what percentage of the 2 million do they comprise?

Answer: Visitation data are collected by traffic counters, sample counts, and registrations. Because visitors are not required to register, the origin of most visitors is not known. However, 1984 data for Hillman Ferry Campground indicated that 57 percent of camping parties were from outside the Valley area. The sample indicated that 31 percent lived within 100 miles of the campground, 36 percent between 100-250 miles, 20 percent from 250 to 500 miles, and the remainder from outside a 500-mile radius. Registrations during 1984 at Brandon Spring Group Camp show 32 percent of the camper nights were attributable to visitors from outside the Valley area.

Day visits by school and other day-use groups are included in the 2 million visitations. About 3 percent of all visits were day visits by school and other day groups.

28. Question: Please provide a state by state breakdown of LBL visits in 1984.

Answer: The data base from which TVA determines the place of origin of its visitors is limited to voluntary registration records at LBL interpretive facilities, welcome centers, and campgrounds. These limited records show that LBL visitors to these facilities in 1984 came from all 50 States, the District of Columbia, and 20 foreign countries. The bulk of TVA visitor data, however, comes from traffic counters and sample counts from which the State of origin is unknown.

29. Question: How many TVA employees work at Land Between the Lakes? Please classify them and their numbers by the different programs and activities in which they are involved.

Answer: The total number of employees during the peak season at Land Between The Lakes is approximately 262. A table classifying employees by program area follows.

<u>Program/Activity</u>	<u>Employees</u>			<u>Total</u>
	<u>Management</u>	<u>Nonmanagement</u>	<u>Personal Service Contractors</u>	
Natural resource management	3	23	5	31
Recreation, Interpretation, and environmental education.....	6	54	17	77
Support operations..... ^a	12	116	2	130
LBL manager's office staff ^a	<u>3</u>	<u>21</u>	<u>-</u>	<u>24</u>
Total employment.....	<u>24</u>	<u>214</u>	<u>24</u>	<u>262</u>

a. Includes manager's support staff and administrative, personnel, library, and janitorial services.

30. Question: Please provide a detailed listing of all energy production, use, or conservation research, development and demonstration activities performed, or participated in, by TVA in FY 84. As part of this listing, please provide funding levels for each activity and how much came from the power budget and how much from the nonpower budget; and other partners, subcontractors, etc. who participated in the work and their share of the costs.

Answer: The following information shows a breakdown of energy production, use, or conservation research, development, and demonstration activities performed during 1984. For each project, the funding amounts and participants are shown.

Energy Production

AFBC Pilot and Demonstration Project Activities

\$3,900,000	TVA power funds
4,370,000	EPRI funds
<u>86,000</u>	Appropriated funds

\$8,356,000

Gaseous Emission Control Activities

\$112,000	EPA funds
5,000	NOXSO Corporation funds
<u>610,000</u>	TVA power funds

\$727,000

Shawnee, Kentucky, Test Facility E-Beam/Spray Dryer

\$ 395,000	Research-Cottrell Environmental Sciences funds
<u>2,300,000</u>	TVA power funds

\$2,695,000

Fuel Cells

\$57,000	DOE funds
<u>40,000</u>	Appropriated funds

\$97,000

Coal Cleaning Activities

\$56,000	DOE funds
15,000	Kentucky Department of Energy funds
6,000	EPA funds
<u>360,000</u>	TVA power funds

\$437,000

Solid Waste Disposal Activities

\$ 4,000 EPA funds
 285,000 TVA power funds
 \$289,000

Nuclear Systems Research Activities

\$ 117,000 EPRI funds
 1,650,000 TVA power funds
 \$1,767,000

Waste Product Utilization Activities

\$380,000 TVA power funds

Condenser Targeted Chlorination System Technologies Evaluation Activities

\$460,000 TVA power funds

Particulate Control Activities

\$85,000 TVA power funds

Continuous On-Line Nuclear Assay of Coal (CONAC) Activities

\$470,000 TVA power funds

Miscellaneous Fossil Research Projects

\$2,800,000 TVA power funds

Environmental Support Activities

\$220,000 TVA power funds

TVA Membership Fees and Dues Associated with Power R&D Production Activities

\$17,200,000 TVA power funds

Solar Research Activities

\$520,000 TVA power funds

General Salaries and Support Activities Related to Production R&D

\$4,100,000 TVA power funds

Total Energy Production

\$35,340,000	TVA power funds
126,000	Appropriated funds
<u>5,025,000</u>	Contributed by other participants
\$40,491,000	

Energy ConservationElectric Vehicle Research Activities

\$ 30,000	US Postal Service funds
268,000	EPRI funds
<u>680,000</u>	TVA power funds
\$978,000	

Solar Research Activities

\$700,000	TVA power funds
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Waste Heat Research Activities

\$145,000	TVA power funds
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Other Miscellaneous Utilization Research Activities

\$150,000	TVA power funds
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TVA Membership Fees and Dues Associated With Energy Use R&D Activities

\$355,000	TVA power funds
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Load Management Forecasting Research Activities

\$1,450,000	TVA power funds
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Energy Technology and Marketing Assessment Research Activities

\$450,000	TVA power funds
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Wind Energy Research Activities

\$750,000	TVA power funds
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Indoor Air Quality Studies

\$45,000	TVA power funds
<u>51,000</u>	EPRI funds
\$96,000	

Other Renewable Resources Research Activities

\$750,000 TVA power funds

Solar Ponds

\$428,000 Appropriated Funds

TVA Membership Fees and Dues Associated With Conservation R&D Activities

\$350,000 TVA Power Funds

Total Energy Conservation

\$5,825,000 TVA power funds
 428,000 Appropriated funds
 349,000 Contributed by other participants

Total Research and Development

\$41,165,000 TVA power funds
 554,000 Appropriated funds
5,374,000 Contributions by other participants

 \$47,093,000 Total research and development

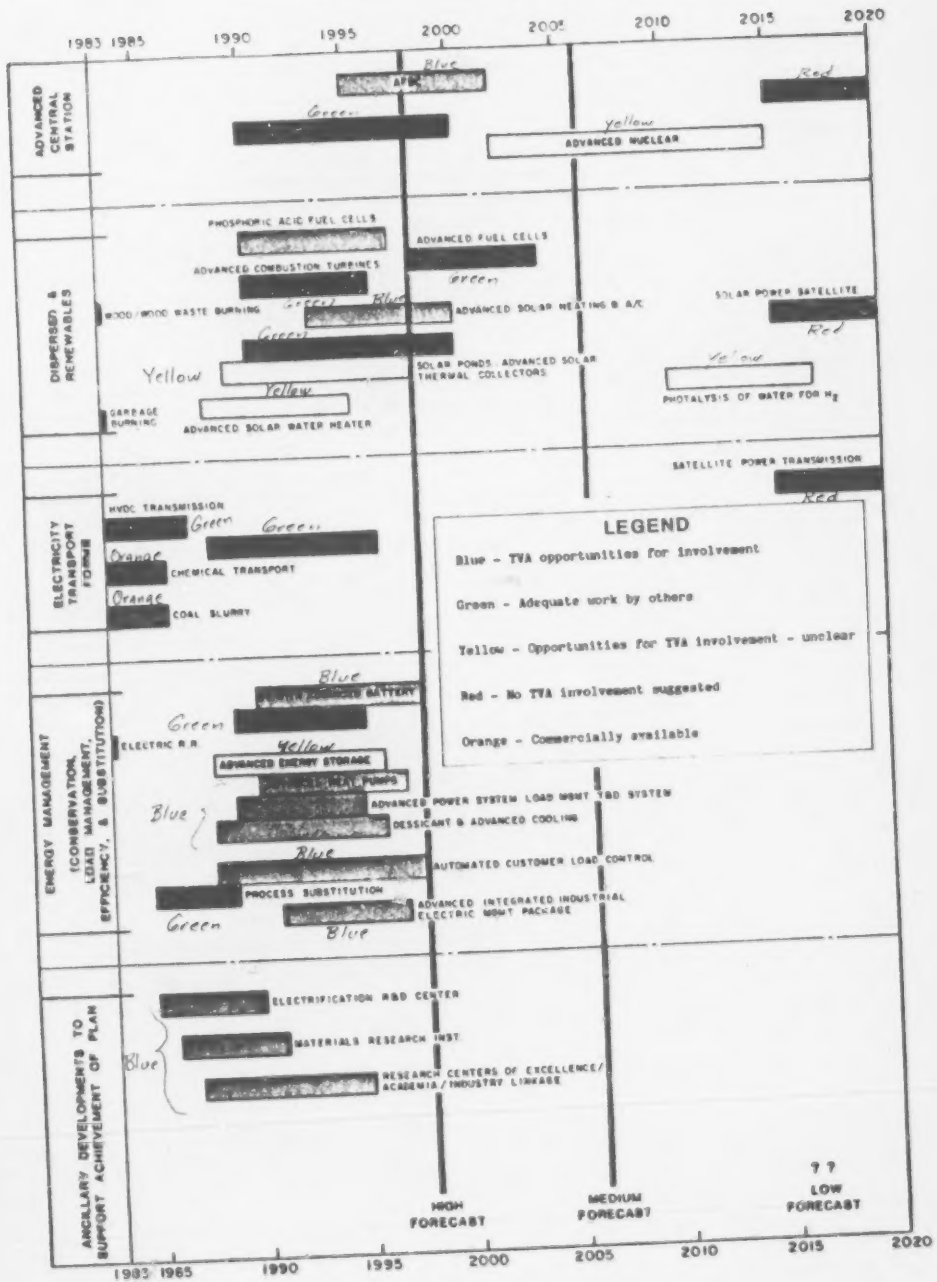
31. Question: How does TVA select its power related research and development priorities?

Answer: In selecting power-related R&D priorities, TVA uses a long-range strategic plan approved by the TVA Board of Directors, which considers a wide range of technologies which may have applicability to the objectives of the TVA power system. These objectives are: (1) implementing renewable energy supplies, conservation measures, and efficient end use applications; (2) keeping existing generating plants healthy and maintaining or improving availability; and (3) maintaining centralized and dispersed electricity generating options.

To address the uncertainties associated with load growth and regional economics, TVA continually reviews research, development, and demonstration (RD&D) initiatives for the most promising future technologies. This permits orderly development and expansion of those activities while maintaining TVA's flexibility to adjust to changing situations. It also allows TVA to capitalize on the work of others in those activities. This plan allows TVA to (1) identify what to focus on in the future, and (2) based on the perceived need and benefit, determine the magnitude of the effort to be undertaken. Emphasis on activities, such as renewables, dispersed generation, efficient end use, and conservation, will be increased in the future plan. RD&D initiatives currently being considered are shown in the attached graph, "Window of Commercial Feasibility."

TVA's P&E management and the Board of Directors review competing projects in light of the anticipated economic benefits to the ratepayers and expected project costs and risks in developing specific technologies. TVA power funds are devoted to only those RD&D projects which are expected to directly benefit the TVA power system. A major element in the selection of a project is TVA's ability to take advantage of the work of others, such as the Electric Power Research Institute, and cofunding by private industry.

WINDOW OF COMMERCIAL FEASIBILITY FUTURE TECHNOLOGIES



32. Question: How much of TVA's power budget is spent on research, development, and demonstration? Has this funding level remained constant through the years or does it reflect a constant or changing percentage of the total power budget? If so, how is this percentage determined? How does this compare to similar expenditures by other utilities in the nation?

Answer: TVA believes that, in keeping with the intent of the TVA Act and in its role as a Federal corporation, TVA should be a leader in power research, development, and demonstration. TVA budgets expenditures for research, development, and demonstration projects to equal up to 2 percent of power revenues. However, the amount TVA plans to spend in any one year is determined by a project-by-project review in the annual planning and budgetary process. Power R&D managers must justify both ongoing and new projects for which funding is proposed in the budget year.

As a result of the various activities that have been undertaken with the intent of benefiting TVA ratepayers, TVA's RD&D expenditures, as a percent of gross power revenue, for fiscal years 1981 through 1984 averaged 1.33 percent and are estimated at 1.2 percent for fiscal year 1985. These expenditures include contributions to the Electric Power Research Institute (EPRI). In fiscal year 1984 the contribution to EPRI totaled \$21,755,000. A 1984 survey conducted for EPRI found that EPRI members spent 0.6 percent of revenues on R&D in 1983 and that nonmembers spent an average of 0.2 percent of revenues.

33. Question: From your FY 86 budget request submitted to OMB, it appears that many of your economic development programs incorporate energy conservation as a program element. Since your general philosophy about energy conservation (at least insofar as electric energy is concerned) is that it saves the power system money, shouldn't these conservation efforts be paid for out of the power budget?

Answer: Power conservation components of these activities are supported by power system funds. TVA has begun to incorporate energy conservation activities as an element of several economic development program activities. This is simply another example of TVA's integrated approach to economic development. In the existing industries program, for example, energy management and renewable energy assessments are offered along with eight other economic development and environmental quality services to help existing firms implement job-creating expansions. Power revenues are used to fund these energy conservation activities which serve as a complement to the other services funded through our appropriations request.

34. Question: What is the cost sharing with other utilities on the 160-megawatt AFBC demonstration plant at the Shawnee plant site?

Answer: The intended participants in the 160-megawatt AFBC demonstration plant and the amounts pledged by each are:

	<u>\$ Million</u>
TVA.....	40.0
Duke Power Company.....	10.0
Commonwealth of Kentucky.....	10.0
Electric Power Research Institute.....	75.0
Combustion Engineering.....	17.9
Fluor Constructors International, Inc.	5.5
Consolidated Edison Company of New York.....	5.0
Commonwealth Edison Company.....	5.5
Carolina Power and Light.....	3.9
Southern Company Services.....	6.8
Virginia Electric and Power Company.....	3.0
Empire State Electric Energy Research Corp. ..	5.0
Westmoreland Coal Company.....	1.0
A. T. Massey Coal Company, Inc.	1.0
Peabody Holding Company, Inc.	4.0
Norfolk and Southern Railroad.....	5.0
CSX Corporation.....	5.0
Pyro Mining.....	<u>0.3</u>
Total.....	<u>203.9</u>

In addition to the above, the U.S. Congress has provided \$30 million to DOE for transfer to this project. It also should be noted that participating utilities which are members of EPRI contribute through EPRI's participation in this project in addition to their contributions listed above.

35. Question: Please furnish materials which describe your indoor air quality testing program.

Answer: Significant exposure to air pollutants occurs in the indoor environment. As a result, TVA's appropriations-funded indoor air quality work (\$100,000 in fiscal year 1985) focuses on: (1) developing and disseminating information on indoor air quality; (2) providing technical assistance to, as well as cooperating with, government agencies and other organizations; and (3) initiating projects on pollutant sources, effects, and reduction methods. TVA currently assists one State in monitoring for toxic air pollutants in homes and outdoors. This activity includes the development of a new sampler for toxic air pollutants. Indoor air quality monitoring will be conducted as funds permit to help characterize indoor air quality in the Valley, identify problem areas and their cause, and assist the development of control strategies and mitigation measures. A clearinghouse of indoor air quality materials will be maintained to assist in Valley-wide public education and information distribution. Information for a public document about the potential implications of indoor air quality is being gathered. Additional activities are being evaluated. Information, methodology, and mitigation strategies demonstrated in the Valley can be used in other areas.

The fertilizer development program will provide funds (\$137,000 in 1985) for a study of background levels of indoor radon. Results would provide a base against which incremental concentrations of radon from various building material sources could be compared. Power funds will be used in the same 60-home study to estimate seasonal air infiltration rates, and the effects of weatherization and energy use on indoor air quality. Other Federal agencies and private sector organizations are intending to cosponsor the collection of data on additional pollutants.

Other activities supported exclusively by power proceeds address issues related primarily to energy use, such as home weatherization and wood heaters. TVA has prepared two generally available public information brochures on indoor air quality and weatherization that are primarily distributed to Valley residents at the time they have a home energy audit and that are being used by utilities in the Southeast and Northeast as a basis for their own public information efforts.

TVA has conducted cooperative studies using power funds with the Bonneville Power Administration and the Consumer Product Safety Commission on the effects of wood stoves on indoor air quality. The Electric Power Research Institute (EPRI) and TVA have funded Oak Ridge National Laboratory (ORNL) for a detailed analysis of data from a 40-home study in Tennessee. Preliminary work has begun on the evaluation of air-to-air heat exchangers and other control technologies at the TVA Energy Use Test Facility. TVA has cosponsored with EPRI and other utilities a seminar on the

implications of electric utility conservation programs on indoor air quality. Staff members participate in EPRI committees overseeing ongoing studies, the interagency Committee on Indoor Air Quality working groups, an advisory committee for the Lawrence Berkeley Laboratories concentrations of indoor pollutants data base project, and other public and private sector groups involved with indoor air quality. TVA plans to participate with Harvard University and ORNL in a multipollutant 300-home indoor air quality study in Tennessee.

All TVA activities are consistent with the "Federal Comprehensive Indoor Air Quality Strategy" prepared by the Committee on Indoor Air Quality.

36. **Question:** I understand that TVA is conducting research in the effect of wood burning stoves on indoor air quality. Please describe this research in some detail and any results obtained to date. Is this research being funded out of the power budget? What other research has been done and what results have been obtained?

Answer: The testing conducted to date was undertaken to obtain indoor air quality data related to both conventional and catalytic wood heaters in a relatively tight home having approximately 0.37 air changes per hour. The study was conducted by TVA at its Energy Use Test Facility in an unoccupied test home onsite.

A multiplexed manifold sampling system was used to alternately sample one indoor and three outdoor locations for gaseous pollutants. Carbon monoxide (CO), carbon dioxide (CO₂), nitrogen oxides (NO_x), and nitric oxide (NO) concentrations were recorded for each location at the end of each three-minute period. Twenty-four-hour grab samples were taken for total and respirable suspended particulates and polynuclear aromatic hydrocarbons, both outdoors and indoors. An air infiltration rate was determined for each 24-hour test using a tracer gas method.

These tests showed that both conventional and catalytic wood heaters tended to elevate the concentrations of some indoor air pollutants. Except for one defective wood heater, neither the one-hour nor the eight-hour National Ambient Air Quality Standard for CO (35 and 9 ppm respectively) were ever exceeded during testing. Very few one-hour average CO concentrations exceeded 5 ppm. Additionally, the wood heaters were found to contribute little to NO_x.

The tests also showed that both conventional and catalytic heaters have the potential to exceed the 24-hour secondary total suspended particulate air standard (150 ug/m₃). No test exceeded the primary standard of 260 ug/m₃.

Indoor air quality studies have largely been a cooperative effort among the Bonneville Power Administration, the Consumer Product Safety Commission, and TVA. All TVA expenditures to date for the wood heater indoor air quality test have been funded from power funds.

These studies were initiated because data for wood-fired residential space heating applications was needed. Little data was available on indoor air quality associated with wood heater use in weatherized homes with low infiltration rates.

Other residential wood combustion research done using power funds has focused on efficiency and emission testing of airtight and catalytic wood heaters. The information developed from these tests has been used extensively by private sector organizations (e.g., American Society of Heating, Refrigeration, and Air-Conditioning Engineers and Wood Heating Alliance) to develop standards and guidelines for wood heater efficiency testing. Most recently, the Environmental Protection Agency has used TVA test data to compare strengths and weaknesses of different emission measurement methods as part of its development of a New Source Performance Standard for residential wood heaters.

37. Question: Please provide the subcommittee with the following information:
- o The annual number and cost of loans TVA has given for installation of wood burning stoves since 1979.
 - o The number of kWh of electricity this total number of stoves has offset from the TVA generating system.
 - o A comparison of the air pollution (O_3 , CO, TSP, etc.) caused per unit of heat delivered via coal generated electricity in the TVA system vs. the average TVA-assisted installed wood burning stove.

Answer: The annual number and cost of TVA loans for installation of wood heaters under the TVA program since 1979 are:

<u>Fiscal</u> <u>Year</u>	<u>Installations</u>	<u>Amount Loaned</u>
1979	202	\$106,200
1980	1,440	936,810
1981	1,489	996,170
1982	1,343	940,100
1983	847	635,250
1984	584	254,880

Through fiscal year 1984, 5,905 wood heaters have been installed under TVA's wood heater program. This resulted in an estimated electric energy saving of 35.6 million kWh through fiscal year 1984.

The following is a comparison of nominal coal-fired power plant and wood heater stack emissions (gms/kWh).*

	<u>TSP</u>	<u>SO₂</u>	<u>NO_x</u>	<u>CO</u>
Power plant.....	0.15	13.4	4.1	0.12
Wood heater:				
Noncatalytic.....	12.0	0.10	0.11	33.0
Catalytic.....	1.5	0.10	0.23	09.7

*Data for O_3 comparison not available.

38. Question: In answering a question about TVA's wood burning stove program for the Committee's FY 1986 budget review, TVA responded that this program is not offered in nonattainment areas and areas in which there are more than 150 wood heaters per square mile. Is it possible that this wood burner program might have the effect of precluding some types of industrial development by "using up" increments of clean air and edging some areas closer to nonattainment status. Have there been any instances of this occurring in the TVA area?

Answer: To date there have been no instances where nonattainment areas have been expanded due to wood heater emissions. Most of the nonattainment areas are downtown metropolitan areas in which a number of sources contributed to the nonattainment status. Wood heating has never been identified as the sole cause of nonattainment in any of these areas. While residential wood heaters do contribute significant levels of particulates (TSP) and, to a lesser extent, carbon monoxide and their increased use may contribute to a delay in achieving attainment status or may inhibit attainment of ambient standards, the use of wood heaters has not significantly used up increments of clean air in the TVA area.

39. Question: Why is TVA's hardwood fuels research categorized under "National Fertilizer Development" in the TVA budget justification?

Answer: Although this program appears under the major heading "National Fertilizer Development," its budget and activities have retained a separate identity in TVA's budget documents. While it may appear initially that the hardwood fuels research program has no direct relation to the work of the National Fertilizer Development Center (NFDC), there are several compelling reasons for its location there. First, NFDC conducted pilot plant work under contract for USDA's Forest Products Laboratory (FPL) on wood hydrolysis in the early 1950s and thus has the experience and cumulative knowledge of the technology. Second, chemical and microbiological advances are the key technical elements for successful development of this project. NFDC has expertise in these disciplines. The NFDC also has the infrastructure, laboratories, and pilot plant experience to conduct research and development in the area of wood hydrolysis, sugar fermentation, and ethanol or other product separation. Finally, the NFDC has a proven performance record for developing commercially viable integrated production and marketing systems and is highly respected for its ability to successfully transfer technology, as is evidenced by its fertilizer technology introduction program.

40. Question: Please describe in detail TVA's aquaculture program. What is the origin of this program? What have been TVA's expenditures for this program over the years? What have been the results of this program?

Answer: TVA aquaculture activities are divided into two major components. The first includes technical assistance and waste heat aquaculture. It provides technical assistance to private commercial fish producers to help control disease and improve water quality, and other culture problems. In the past the program emphasized marketing assistance and development of techniques to use heated water from TVA steam plants to produce aquaculture crops. TVA is currently trying to locate a private commercial aquaculture operation at one of these plants.

The program originated in the early 1970s in response to a need by fish farmers for cost-effective production information about channel catfish and trout which was not otherwise available. From this TVA moved into its current role of assisting the industry with disease identification and treatment, and other culture problems.

Funds expended in conducting this component of the program are as follows (in thousands of dollars):

<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>
359	599	277	248	255	204	50

Total funding over the period has been \$1,992,000.

This program has resulted in dramatic increases in aquaculture production in the Valley. Channel catfish production has grown from 200,000 to 700,000 pounds annually, while rainbow trout production has expanded from 200,000 to 1.2 million pounds from 1970 to 1985. These industries are worth more than \$1.7 million annually at the producer level. In addition, a new and growing bait minnow production industry has been developed in the western Valley. TVA efforts in providing technical assistance with production and marketing problems have been instrumental in bringing about these increases. Techniques for commercial waste heat aquaculture production have been developed and demonstrated. As a result, an economically attractive production strategy has been developed for use at a TVA coal-fired steam plant.

The second component of the program involves the development of aquatic systems for animal waste management. TVA is developing methods to increase the yield of protein from aquaculture systems through the use of an exotic fish (tilapia) that can efficiently use the nutrients from animal wastes. Specific studies conducted include determining optimum rates of organic fertilization,

developing improved strains of tilapia, developing culture and overwintering facilities, and developing systems using several species to optimize production in aquatic animal waste systems. The program originated in the mid-1970s as part of a larger effort to treat and utilize agricultural wastes.

Expenditures for this component of the program are as follows (in thousands of dollars):

<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>
82	134	142	184	355	432	369	286	310	437	380

Total funding over the period is \$3,111,000.

As a result of these efforts, effective systems to recover valuable nutrients from animal wastes, to increase farm income through an additional enterprise, and to reduce environmental problems have been developed. The technologies developed have potential for national and international use. Technologies developed for the production of tilapia provide possibilities of low-cost, low-technology fish culture systems, especially for developing nations. Tilapia strains developed at TVA are now being used in programs in Florida and Idaho, and TVA researchers have worked closely with researchers in Israel on several phases of this project.

41. Question: Is TVA presently investigating ways in which private industry might take over a larger share of the fertilizer R&D efforts? If so, what are they and what sort of progress is being made?

Answer: Yes, we are looking at a lot of possibilities. It is fair to say that we really do not know yet what will work, but options are being explored.

From a practical standpoint, imposition of a tax on fertilizers would be the most workable alternate way to support the entire TVA fertilizer research program. The simplest approach would be to impose a tax of \$1 per ton. The major problem would be providing a mechanism for collecting the tax. This might be done through arms of State governments which already collect fees or taxes on fertilizers. With about 50 million tons of fertilizer sold to farmers annually, \$1 per ton would fund the NFDC program and perhaps provide sufficient funds to cover administrative costs if administration were handled through existing organizations.

A user fee applied to TVA's experimental fertilizers would be totally counterproductive. By their very nature--being experimental, produced for brief periods, and in relatively small tonnages--the 160,000 or so tons now produced annually to complete engineering development and to support industry introduction and market creation cannot be manufactured competitively with products made in huge commercial plants. Either eliminating the present appropriations funding for limited prototype operations or adding a user fee to each ton produced would halt this highly effective aid to technology transfer.

We have also developed a rather lengthy list of current activities other than fertilizer production for which charges might be made, and we have given considerable thought to possible price schedules for these services. More specifically, we are looking at the feasibility of putting price tags on such things as laboratory tests, pilot-plant operations, engineering consultation here and in the field, providing marketing information, equipment evaluations, etc. And we are giving serious consideration to the kinds of projects which might be conducted and funded jointly by TVA and one or more private interests. We have agreed recently to do a few studies for which industry firms will pay us, but we have not instituted a formal plan for charging for a wide range of research-related work. The total receipts from such charges, however, would represent only a small portion of the total fertilizer research and development budget.

Charging for TVA's services represents a radical change. We have taken the view, as the Congress has, that since the results of our work tend to benefit the entire public, not just those specific firms who may contract to use our technology, it is appropriate to support the research with public funds.

Charging for TVA's services also runs the risk of changing the structure of the fertilizer industry and reducing the quality of TVA's research. Because TVA has not generally charged for its research services and sells its experimental fertilizers at a competitive price (which is often less than production cost in its small, prototype production facilities), that fertilizer and the knowledge to carry out the chemical and manufacturing processes that produce it are available to the public on a widespread basis. Small producers, who could not afford to contract individually for TVA research services, are characteristic of the fertilizer industry. If most new developments were for the benefit of the few large companies that could afford to contract with TVA, these small producers may not be able in the long run to remain competitive in price or product. Moreover, TVA uses this widespread and public dissemination of its research to gather additional field test and performance information which is used to modify and improve the original chemical and manufacturing processes.

48. Question: Certain industry groups in the Valley have claimed that TVA's power rate structure for industrial customers is discouraging new and existing industrial development in the Valley. Do you believe this is so? Might not the public good be just as well served by balancing out to some extent residential and industrial power rates? Why or why not?

Answer: The cost of TVA power has remained essentially unchanged since 1982, which has improved TVA's position with other utilities in the area. While we cannot continue to hold charges unchanged in the future, we expect our charges to further improve in comparison with our southeastern neighbors. In April 1981, when compared with 26 other regional rates, TVA's rates for a large industrial load (20,000 kW demand, 13,140,000 kWh monthly consumption) were the 13th lowest. When the same comparison was made again in April 1985, TVA's rates were the 7th lowest.

Further, in order to assure the relative competitive level of our industrial rates we have developed a limited interruptible rate which has proved most popular. While helping to achieve additional efficiencies in power system operations, it is enabling customers that use it to achieve substantial savings in power costs. We are optimistic that stable power rates and an ample supply of reliable power will attract more industrial activity during the coming years. We will continue to work closely with industry to find ways to keep power supply costs as low as possible, and we believe the beneficial results of these efforts will be evident.

The cost-of-service principle that each class of customer should bear the costs incurred by the electric supplier in serving that class plays an integral part in the establishment of electric rates for the various customer groups in the TVA region. The detailed cost-of-service studies that are utilized are updated periodically. Historically, various industrial groups have objected to certain aspects of TVA's cost-of-service studies, most notably TVA's longstanding practice of allocating the benefits of the low-cost hydroelectric generation to residential consumers. This is consistent with TVA's responsibilities in carrying out the provisions of the TVA Act. The practice has been carefully reviewed, including consideration of public comments by industrial consumers and others, and no basis was found for expanding or curtailing the allocation.

42. Question: I am concerned that the TVA Flood Prevention Program duplicates functions that are already provided by another Federal agency--the Federal Emergency Management Agency. Please describe how your program is not duplicative of FEMA's program.

Answer: TVA's floodplain management program and the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP) complement rather than duplicate each other. These efforts are fully coordinated to the advantage of both programs.

The NFIP deals with flood insurance and the minimum local floodplain regulations which a community must agree to enforce to qualify its residents to purchase flood insurance. After a community comes into the NFIP, the role of FEMA is primarily regulatory, that is, trying to see that the community enforces its floodplain regulations.

Flood insurance is but one element of a total regional flood damage reduction effort. Our experience is that most communities need substantial technical assistance to make effective use of floodplain regulations. Therefore, in furtherance of TVA's regional flood control mission, our floodplain management program works with communities to more fully incorporate flood damage prevention into all of their planning and programs. The emphasis is on local understanding of the flood hazard and in finding ways to accommodate orderly growth and development consistent with the particular hazard. TVA does this primarily by providing technical data, guidance, and encouragement to community officials.

TVA pioneered floodplain regulations as necessary nonstructural control measures to supplement the flood damage reduction provided by the reservoir system. TVA's initiatives have been disseminated throughout the country and have provided information on methods of local flood prevention. We have found our original cooperative approach to also be the most efficient way to achieve a broad range of environmentally acceptable flood damage prevention measures centered on local planning and implementation. TVA promotes such efforts and provides the specialized technical advice and analyses necessary to make such efforts effective. It assists in development of comprehensive community flood damage reduction plans to guide implementation of a variety of largely nonstructural flood damage reduction measures.

A key TVA role is to provide the specialized engineering technical guidance necessary in planning for flood damage prevention, which most State and local governments in our area otherwise do not have available. Hundreds of requests for such help are received each year. This is a positive planning role to accommodate development consistent with the flood hazard. It supplies the technical muscle to make State planning assistance effective. It supplements the regulatory role of the flood insurance program and has resulted in many communities coming into the flood insurance program or resolving problems that would have otherwise resulted in their withdrawing from that program.

Whenever TVA develops flood hazard information for an additional stream reach or community with impending development pressures, we first ensure that such efforts do not interfere with or duplicate FEMA's work under the National Flood Insurance Program. We then share the completed work with FEMA. When TVA enters into a contract with a community to provide such assistance, we require that community to establish and maintain eligibility under the flood insurance program.

We believe that this emphasis on nonstructural flood damage reduction measures, coupled with flood insurance, makes a sound basis for the Nation to deal with mounting flood damages. Over time it is certainly less expensive than building additional projects to reduce flooding after development has occurred.

43. Question: TVA has an impressive record in the field of environmental protection. Recently, TVA has launched an effort in the area of hazardous waste disposal and management. There are several Federal statutes which deal with these matters, and under those statutes, the roles of state, local and Federal Governments are clearly defined. Where does TVA fit into these programs? How is TVA uniquely qualified to supplement activities that are the responsibility of other government agencies?

Answer: TVA does not have regulatory responsibilities in hazardous waste disposal and management and always works in cooperation with the appropriate Federal, State, and local agencies. However, as a regional development agency charged with the operation of a vast system of dams and reservoirs, TVA recognizes that its statutory responsibilities are affected by problems associated with the disposal of hazardous waste. A recent study found that nearly 9 million tons of hazardous waste are generated annually in the TVA 201-county region. Groundwater contamination is an increasing problem in the region, and studies have shown that one of the major causes of this contamination is improper waste disposal. Valley industry is challenged by this situation to develop cost-effective waste management techniques in order to remain competitive.

In keeping with our longstanding resource conservation efforts, TVA, as a part of its responsibilities inherent in being a major employer and resource development entity, contributes to the work of regulatory agencies to help protect groundwater and surface water quality in the Tennessee River system. There is a tendency of governments and others to move in an unproductive direction when waste issues are raised. A current dilemma illustrates this. One local governmental unit has exhausted its disposal capacity and no part of the unit is willing to have further capacity sited. At present, TVA's primary focus is on increasing public awareness of the problem and gaining public acceptance of needed facilities. Due to a variety of factors, only one consolidated incineration and disposal facility has been licensed to date in the entire eastern United States. TVA provides the critically needed interface between the public, the regulated industry, and the regulatory agencies.

The Environmental Protection Agency and the States are responsible for promulgating hazardous waste disposal regulations and setting standards to protect public health and the environment. They also have taken the lead in researching the effects of hazardous wastes and effective means of disposal and management. At the request of and in cooperation with EPA and other State and local agencies, TVA supplements this work by conducting or contributing to studies that address hazardous waste management regionally. As the Nation's largest power system, TVA has extensive experience in storage, collection, processing, disposal, and utilization of hazardous waste and hazardous waste products. This capability was developed with funds from TVA's self-financing power system and is then shared with others using the relatively small amount of appropriations available for this program. The Tennessee Valley region thus reaps tremendous benefits from this partnership with the power system by providing cost-effective access to this capability. TVA's hazardous waste program is a critical component of its regional development and resource conservation mission. The lessons learned and solutions reached in the region can serve as an example for the entire Nation.

44. Question: Similarly, it is my understanding that TVA is engaged in a number of other activities that may or may not duplicate activities of other agencies of government. Please describe what unique role TVA plays in areas such as small business assistance, erosion control, and TVA's drought research program.

Answer: The question of duplication is one which has been raised since the inception of TVA. TVA and the agencies often cited in references to duplication have worked very carefully to assure that such duplicative roles do not exist. The fundamental difference between TVA and other Government agencies is how TVA implements its role and the internal capabilities inherent in TVA's responsibilities of fertilizer research, land and reservoir management, and power production. TVA tries to work at the margin where it cannot single-handedly achieve the intended goals, but where it is a necessary catalyst to produce results. The concept of the TVA partnership recognizes this also. Local government, other Federal Government agencies, private business, and Valley residents, either individually or in combination, are necessary to achieve results.

Given the magnitude of the needs which TVA is attacking, the larger problem is not duplication, but rather the lack of resources with which to correct the natural resource and economic problems facing the region and the Nation. TVA's cooperative approach could result in isolated incidences of duplication of effort. To assure that there is no duplication with other Federal and State efforts, we have in place agreements with agencies within the Department of Agriculture, the Environmental Protection Agency, the Department of State, the Department of Commerce, the Department of the Interior, the Department of the Army, the Appalachian Regional Commission, and the Department of Energy, as well as the seven States of our region. In addition, we currently are working out an agreement with the Department of Defense.

TVA's role is primarily one of technical assistance. While limited amounts of funds have also been provided in some programs, they are only made available to facilitate the provision of essential technical assistance.

Innovation and research are important components in meeting TVA's power, fertilizer, and reservoir responsibilities. These activities have a potential impact on most segments of Valley economic and natural resources. These programs also are able to provide a wealth of information and experience which can be applied to regional needs.

TVA has several activities which are beneficial to small businesses, based upon TVA's conviction that new business formation and expansion is the surest and soundest way to economic growth in the Valley region. While TVA does not make small business

loans, it does provide technical assistance in specific management areas, as in our existing industries program, minority economic development program, forestry, regional water management, and the Valley agriculture programs. TVA may also work with small businesses through more community-focused programs such as SOCC and Townlift. New business formation is a fragile process under the best of circumstances, circumstances that commonly do not exist in many areas of the Valley region. TVA programs are designed to help reduce such barriers to improvement.

Erosion control has long been important to TVA because of erosion's contribution to siltation in reservoirs and its effects on water quality. In the western Valley, where the problem is recurring as a result of changing farm markets and crops, TVA brought other agency officials together and helped develop a multiagency, multi-State approach to speeding up soil and water conservation activities. Results have been dramatic. Conservation and farm development plans have been brought together to help reduce soil erosion and at the same time improve farm income. In the eastern Valley abandoned surface coal and mineral mines have resulted in a variety of problems. TVA has developed action-oriented, low-cost techniques that have made it economically feasible to reclaim many of these lands and expand wildlife habitats, and have aided in the development of adapted native plant stock which can better grow in the harsh soil conditions of recently reclaimed lands. All this work was performed in cooperation with State conservation and wildlife agencies, the U.S. Department of the Interior, EPA, and private business.

TVA drought research consists of two components, groundwater research and water supply development. TVA, in cooperation with USGS and State agencies, is using its existing computer modeling capabilities to profile and assess ground capabilities and stress. In those areas where communities have growing or periodic problems with groundwater and surface water sources, TVA has technical assistance programs that improve efficiency of existing municipal systems and aid in developing plans for regional distribution systems to stabilize source availability.

45. Question: Please provide the Subcommittee with a chronology of the events leading up to the Board's decision to temporarily shut-down the Browns Ferry Nuclear Plant.

Answer: Beginning in early March of 1985, after a series of incidents at Browns Ferry Nuclear Plant, Hugh Parris discussed with the General Manager and the Board a proposal that the units be shut down and not restarted to give TVA time to make both facilities and management adjustments. The General Manager and the Board encouraged this approach to deal with the problems at Browns Ferry, and on March 19 TVA announced that it would not restart Browns Ferry until we were satisfied that we could demonstrate significant improvements in the quality of the plant's performance.

46. Question: How much is the shut-down Browns Ferry plant costing TVA and the power consumers of the Valley. Please provide a total per-day and per-kilowatt hour figure. Is the cost burden being shared equally among residential, commercial, and industrial users?

Answer: Prior to the shutdown of the Browns Ferry plant in March, extensive refueling and maintenance outages were already scheduled. Unit 2 was in the process of an outage planned to extend through late summer. A planned unit 1 outage was scheduled to begin in June and last until late winter of 1986. Unit 3 was not in service at that time, but is expected to return to service later this year and remain in service through November. Therefore, at least one and often two units at Browns Ferry would have been out of service during the remainder of the fiscal year for refueling and maintenance even without the extended shutdown. The fuel cost differential between Browns Ferry and existing coal-fired units is 11 and 9 mills per kWh for units 1 and 2 respectively, or approximately \$250,000 per day for each Browns Ferry unit under full operation. Accounting for the expected refueling, maintenance, and emergency outages, the added costs for the estimated 2.2-billion-kWh generation lost because of the extended shutdown of units 1 and 2 during fiscal year 1985 is approximately \$24 million. This compares to an estimated total production expense in fiscal year 1985 of \$2,035 million and total estimated revenues of \$4,547 million.

There is no intention to adjust fiscal year 1985 rates to reflect these cost increases, which are expected to be carried by contingency and/or offset by cost reductions in other areas. At this time, it is not possible to estimate what effect a continuation of the shutdown into fiscal year 1986 will have on rates for that year.

47. Question: Does TVA presently have any Senior Reactor Operators on its payroll? If not, please describe the difficulties TVA has had in securing persons with this qualification. What is TVA doing to remedy this situation? Have other utilities experienced the same difficulties? What are they doing to remedy this situation? Please project if and when TVA may resolve any problems in this area.

Answer: TVA currently has approximately 350 senior reactor operators. These operators are all generated internally as employees progress from our operator training programs through various positions to the senior reactor operator level. TVA experienced a 6.5 percent attrition rate last year, but currently has sufficient personnel to operate our nuclear generating stations. With TVA's extensive commitment to training operators, we will be able to maintain a sufficient number of qualified senior reactor operators for operating our nuclear generating stations. There are not enough to utilize in nonoperational areas such as quality assurance or compliance.

The national shortage of good operationally oriented senior reactor operators will probably continue for the next several years. If asked, any utility would probably indicate that it did not have enough senior reactor operators. A review of job announcements confirms this fact.

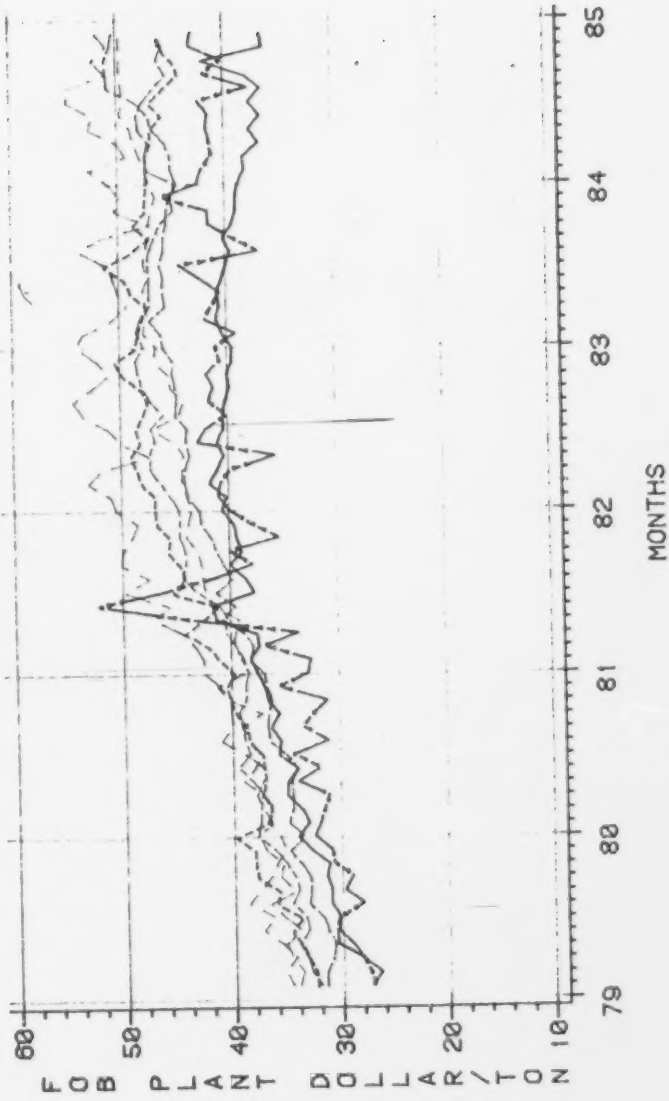
49. Question: What is TVA's purchase price for coal compared to other utilities in the region including Duke Power and Kentucky Utilities?

Answer: The attached graphs Nos. 1 and 2 plot TVA's delivered cost of coal in dollars per ton and that of neighboring utilities, including Duke Power and Kentucky Utilities, for the years 1979-1984. As shown, TVA's coal costs are once again the lowest among these utilities.

Graphs 3, 4, and 5 depict costs for coal received at TVA's and 11 other utilities' plants in terms of cents per million Btus. These 11 utilities make substantial purchases of coal from districts² supplying TVA.

-
1. Alabama Power Company, Appalachian Power Company, Carolina Power and Light Company, Cincinnati Gas and Electric Company, The Detroit Edison Company, Duke Power Company, Georgia Power Company, Indiana-Kentucky Electric Corporation, Kentucky Utilities Company, Louisville Gas and Electric Company, and Wisconsin Electric Power Company.
 2. District refers to the U.S. Bureau of Mines' coal-producing districts. The two most important to TVA are district 9, which consists of western Kentucky, and district 8, which consists of all of eastern Kentucky, North Carolina, north-eastern Tennessee, and parts of southwestern Virginia and southern West Virginia.

DELIVERED COAL COST FOR
TVA AND SELECTED NEIGHBORING UTILITIES

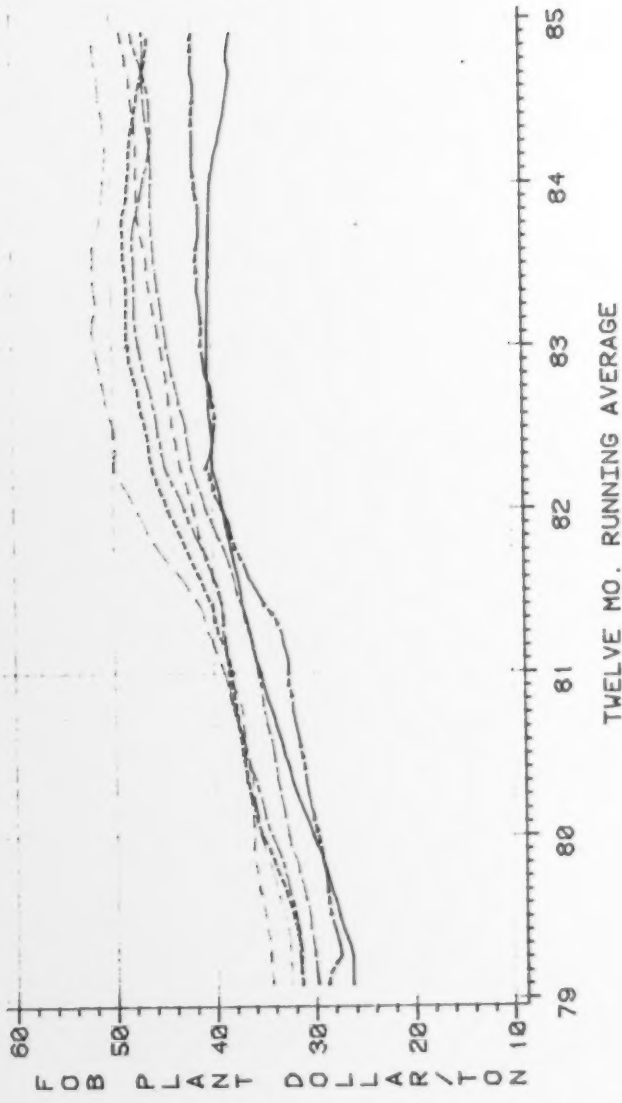


APPALACHIAN POWER
GEORGIA POWER
TENNESSEE VALLEY AUTHORITY

DUKE POWER

ALABAMA POWER
CAROLINA POWER
KENTUCKY UTILITIES

DELIVERED COAL COST FOR
TVA AND SELECTED NEIGHBORING UTILITIES

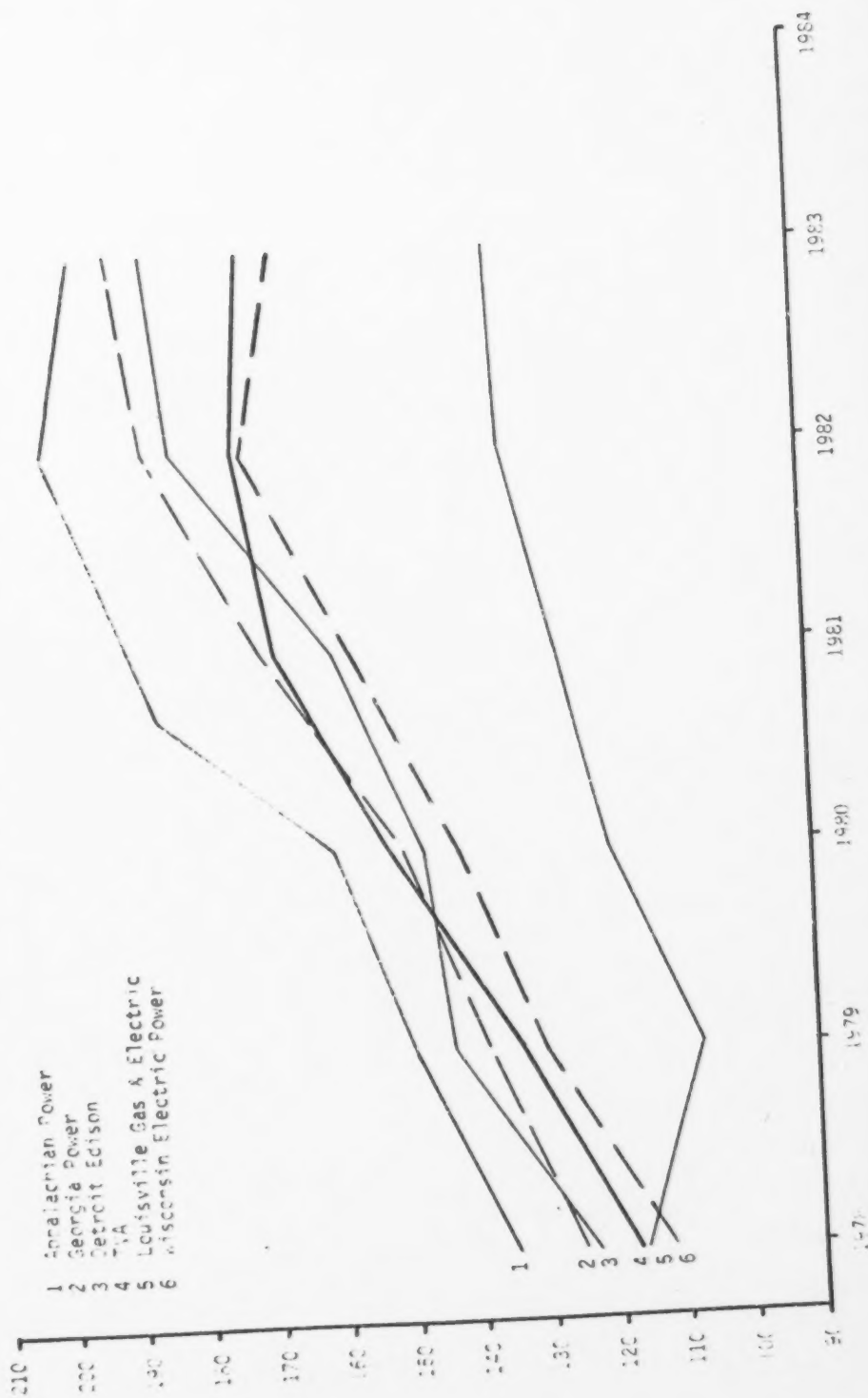


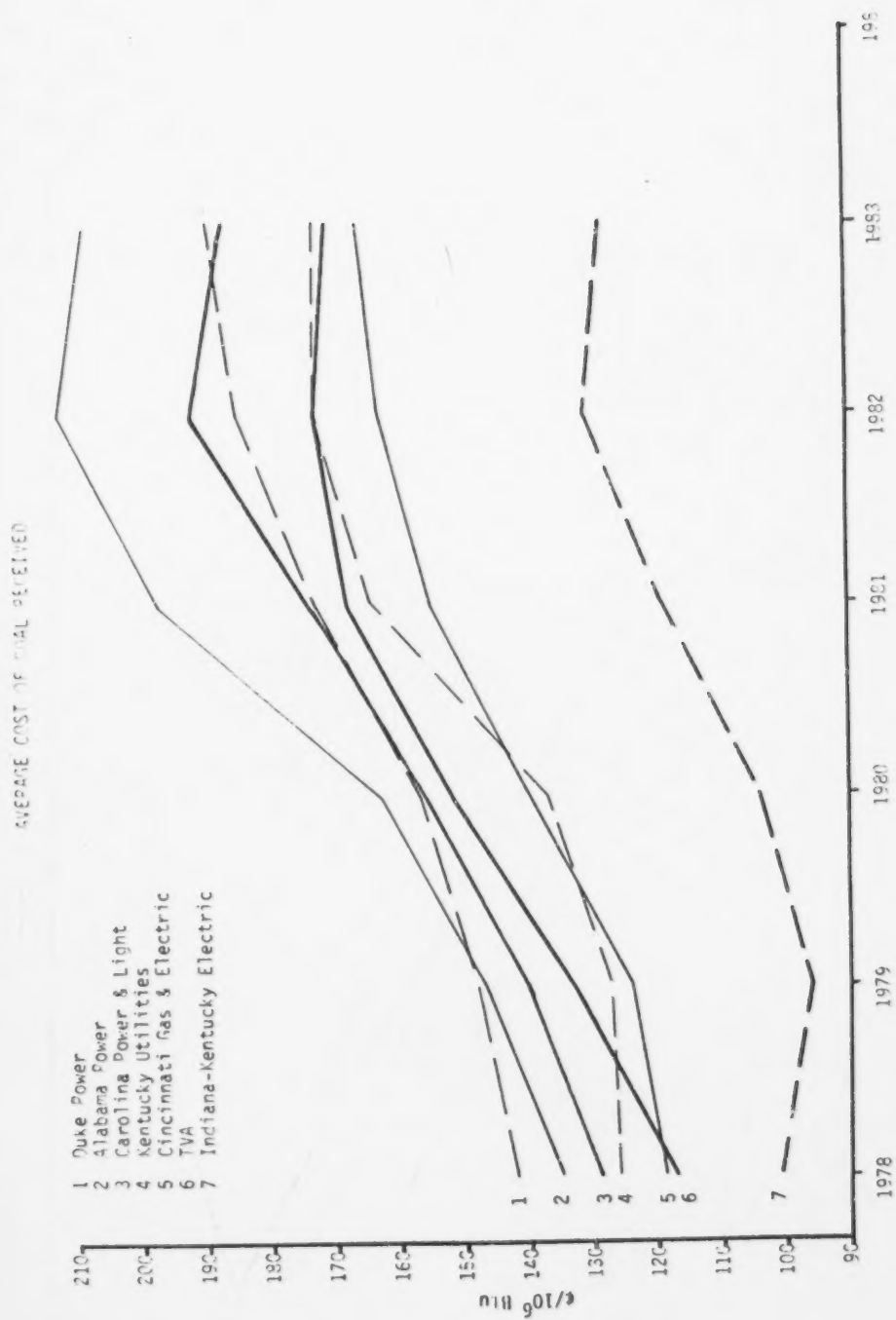
ALABAMA POWER
CAROLINA POWER
KENTUCKY UTILITIES

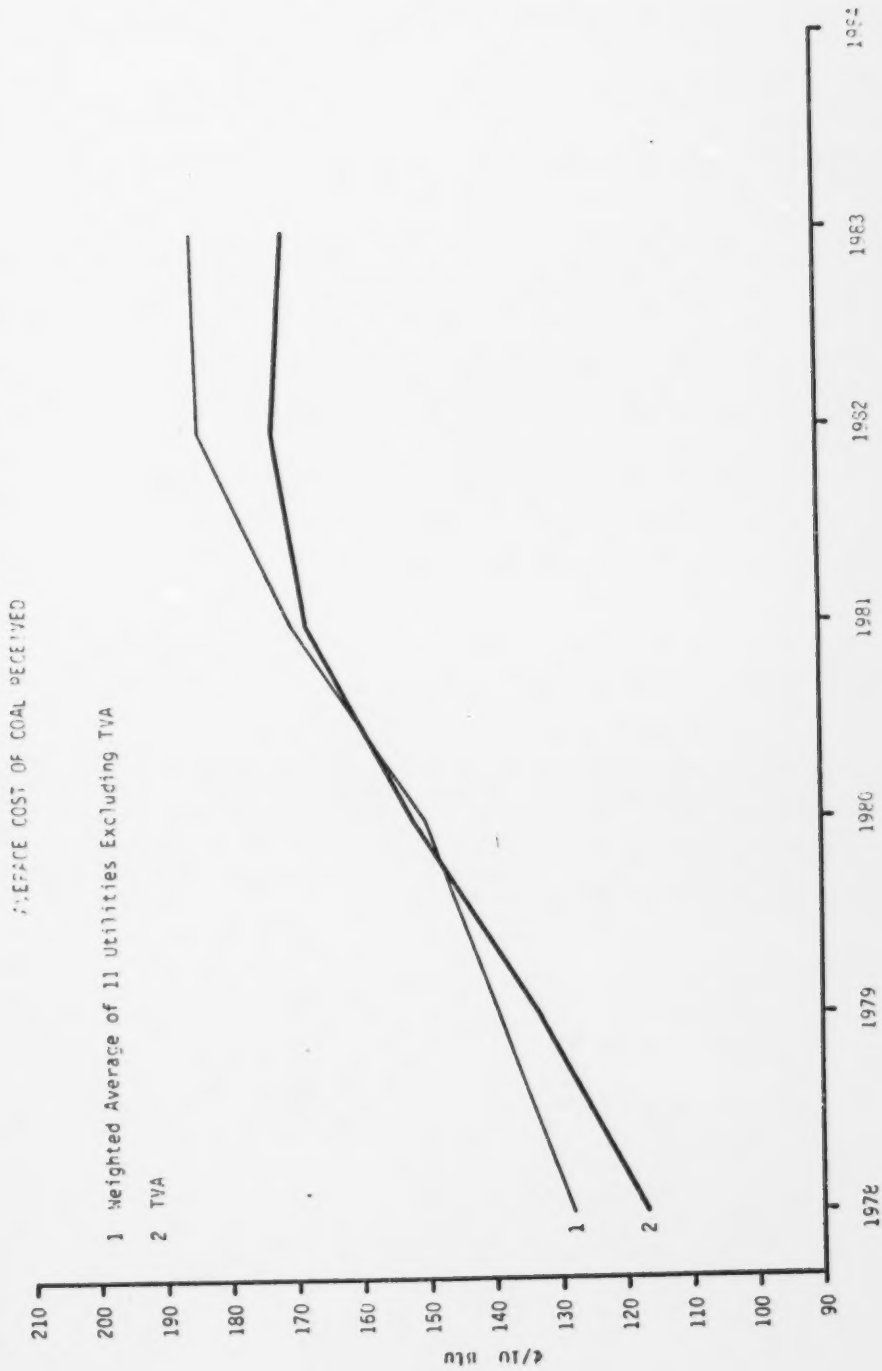
DUKE POWER

APPALACHIAN POWER
GEORGIA POWER
TENNESSEE VALLEY AUTHORITY

AVERAGE COST OF COAL RECEIVED







50. Question: Please provide the location, the acreage, the estimated coal at each, and the purchase price of TVA-owned coal fields. When were these fields purchased? Does TVA have plans to purchase more? Have significant savings been realized by their purchase?

Answer: The statistical data requested is contained in the attached table, TVA Coal Properties, Land, and Rights, September 30, 1984 - Resources, Reserves, and Investment.

TVA does not plan to substantially increase its coal property holdings in the foreseeable future. TVA does have ongoing limited acquisition programs related to presently controlled coal lands. These include the acquisition of "windows" in TVA's coal holdings and extension of known coal deposits. These acquisition programs are designed to enhance recovery of presently held coal deposits, increase TVA's holdings of economically recoverable low-sulfur reserves, and provide the flexibility and control necessary to meet future fuel requirements.

TVA believes there have been, and will continue to be, significant savings realized through ownership and production of its own coal. As noted below, certain of these savings can be measured objectively, while other savings are more subjective.

Basically, coal ownership can provide:

1. Security and reliability of supplies;
2. The opportunity to obtain coal at less than market prices;
3. Leverage in market purchases and contract negotiations;
4. Protection against non-cost-related price increases.

TVA's experience related to the cost of producing its own reserves versus market prices has varied, but, in general, TVA has arranged for production from its reserves when costs were lower than alternative market prices and has terminated such arrangements when market prices fell below costs from TVA properties. As shown in the attached table, cumulative production from TVA reserves through September 30, 1984, was 73.8 million tons. The majority, 52.5 million tons, has been produced from the Camp Breckinridge (Breckinridge) property in western Kentucky. In 1968 TVA issued an invitation to bid on contracts to supply coal to TVA's largest and newest fossil plant, Cumberland, either from privately held reserves or from TVA's Breckinridge properties. Only two offers were received. One offer, too small to supply Cumberland, was purchased for use at other TVA plants. The other offer, Peabody Coal Company's (Peabody), was to produce coal from mines to be opened at Breckinridge. The Peabody offer was accepted after extensive negotiations. Breckinridge has provided a reliable source of coal for Cumberland since 1972. Over the

period (fiscal years 1972 through 1983) the average delivered cost of the Breckinridge coal was \$23.26 per ton versus a TVA system average coal cost of \$23.79 per ton during the same period. However, the market price for coal has been falling, and the average Breckinridge cost now exceeds the average system coal cost by about \$4.00 per ton. Stringent cost-cutting measures have been initiated at this project; however, if Breckinridge costs are not competitive, we will provide for an alternate supply for Cumberland and an orderly shutdown of the Breckinridge project.

Some 12.3 million tons was produced during the 1970s from TVA's Eads and Fabius properties. The average cost paid by TVA for all coal from Fabius and Eads during fiscal years 1972 through 1978 was about \$13.80 per ton versus a systemwide average of \$14.80 per ton during the same period. The Koppers property was also placed in production at a favorable cost in the early 1970s at a time when adequate supplies for our Kingston plant could not be obtained in the open market. Production from these three properties ceased in the late 1970s when TVA coal quality requirements changed, reserves were depleted, and/or cost of production exceeded market prices. All coal from the Red Bird property (3.2 million tons) was produced by a third party under lease arrangements.

The income received from coal leasing and the cost savings of TVA production versus market purchases can be measured. The security, leverage, and price protection aspects brought about by coal ownership and production is difficult to measure. However, there is little doubt that TVA coal ownership/production helped dampen overall coal price increases throughout the turbulent 1970s and saved the TVA ratepayers many millions of dollars through lower fuel costs. These same advantages of coal ownership and production will exist in the future.

TVA COAL PROPERTIES, LAND, AND RIGHTS
SEPTEMBER 30, 1984 - RESERVES AND INVESTMENT

Property	Location	Gross Acreage	Dates Acquired	(In Millions of Dollars)			(In Millions of Tons)	
				Purchase Price	Net Investment ^a	Income	Cumulative Production To Date	Estimated Recoverable Reserves
Camp Breckinridge	W. Kentucky	30,590	1965- 1979	7.4	90.5	9.1 ^b	52.5	159.6
Eads	Illinois	13,232 ^c	1977	4.9	5.4	0.4 ^d	4.3	- ^e
Ewing-Northern Coal Association	Illinois	45,187	1977- Present	45.8	47.5	-	-	418.0
Fabius	Alabama	9,264 ^c	1977	2.4	2.4	4.0	9.0	0.9
Franklin County	Illinois	6,446	1965- Present	0.440	0.518	-	-	65.0
Koppers	Tennessee	52,941	1962	0.625	0.761	1.3	4.8	25.0
Red Bird	E. Kentucky	40,220	1961	0.524	-	4.8	3.2	25.0
Straight Creek	E. Kentucky	8,800	1961	0.010	0.065	-	- ^g	- ^h
Miami	Georgia	18,000	1977	Lease	-	0.2	-	-
Totals		224,680		62.1	147.1	19.8	73.8	693.5

a. Net investment is defined as original purchase price plus or minus adjustments.

b. Royalty payments of \$.15 per ton for No. 9 coal mined and \$.50 per ton for No. 11 coal mined are netted out in the cost of coal produced.

c. The sum of coal rights and surface lands.

d. Income from leasing agricultural lands.

e. No economically recoverable reserves remain.

f. Leasing costs are \$2,000 per year (base year 1970) plus cost of living index adjustment. The 1984 cost of living adjustment amounted to \$3,300.

g. Some 41,000 tons were mined from the Miami property in fiscal year 1984.

h. Recoverable coal exists on this property but data is not sufficient to determine quantity.

51. Question: Please furnish material which describes TVA's pending project proposals to the Department of Energy under the Clean Coal Technologies Program.

Answer: TVA has submitted four proposals to DOE for funding under the Emerging Clean Coal Technologies Program. A summary of each proposal follows.

1. Coproduction of Methanol and Electric Power: Proposed Semi-works Test Program at TVA's Ammonia from Coal Project

This proposes the modification of TVA's ammonia from coal plant at Muscle Shoals, Alabama, to convert 200 tons of eastern coal/day to 125 tons/day of methanol. TVA, along with the Electric Power Research Institute (EPRI), is to choose at least one of three syngas-to-methanol synthesis (Lurgi, ICI, or Chem Systems' Liquid Phase) for testing in a simulated once-through mode. TVA proposes a two-year design and construction period, followed by a two- to three-year test operating period. Eastern- and eastern-Illinois-type coals are to be used. TVA has estimated the project costs as \$40 million, with \$13 million for construction and \$27 million for operations. TVA's share of project costs will be met through use of the existing coal-gas-to-ammonia plant at Muscle Shoals, Alabama. EPRI, in its most recent five-year plan, has budgeted approximately \$20 million (50 percent) for a project such as this and has indicated a strong interest in this project. Federal or other private sector assistance for the other 50 percent (\$20 million) is sought by TVA and EPRI.

2. Phosphoric Acid Fuel Cell (PAFC) Using Coal Derived Gas/ Proposed Test at TVA's Ammonia from Coal Project (ACP)

This proposes a test of a 250-kW phosphoric acid fuel cell stack on coal-derived gas at the TVA ammonia from coal project at Muscle Shoals, Alabama, beginning in 1985 and ending in 1989. Costs for design and checkout are estimated at \$5 to \$6 million above the cost of the PAFC and ACP plant which are both owned by TVA. TVA proposes to provide the existing plant and PAFC stack and is seeking funding for new capital and operating costs. The proposal is contingent upon the gasifier being operated under another proposed program so a slip stream of product gas would be available. There are no other participants involved in the project at this time.

3. Atmospheric Fluidized-Bed Combustion (AFBC) Pilot-Plant-Scale Testing

TVA proposes to modify its 20-MW AFBC pilot plant to evaluate use of circulating fluidized-bed combustion (CFBC) in a utility application. The project will be located at the

Shawnee power plant in Paducah, Kentucky, to test advanced fluidized-bed boiler concepts.

Conversion of the present TVA/EPRI 20-MW AFBC unit to CFBC could be accomplished for an estimated \$7 million, about one-tenth the cost of a new facility. Operating costs for the first year, utilizing the same coal and limestone as AFBC, are estimated at approximately \$7 million. Two additional years of testing on various fuels, including coal-wash tailings, may be accomplished for an additional \$15 million. Total commitment for the conversion and three-year test program would be \$30 million.

TVA proposes to furnish the test facility and equipment and the data analysis facilities as its share of the program. The monetary value of the facility, not counting offsite data analysis equipment, is estimated at approximately \$68 million. DOE is requested to help fund the conversion by supplying funds to build the CFBC boiler, hot cycle, external heat exchanger, and other minor ancillary equipment and to carry out a three-year test program to provide data to the utility industry. TVA will join with DOE in a concerted effort to attract other funds.

4. Dry-Scrubbing Demonstration, 150-MW Spray Dryer/Electrostatic Precipitator (ESP)

TVA proposes to design, construct, and operate a lime-based spray dryer for 90 percent SO_2 removal in combination with an electrostatic precipitator and evaluate this technology at the 150-MW scale. This scale represents the standard module size for utility systems. This combination of a spray dryer/ESP system could be applied to meet future requirements for existing power plants equipped with electrostatic precipitators. An existing boiler in the TVA system will be selected for this demonstration. A high-sulfur (3.5 percent) eastern bituminous coal will be used. This demonstration would be an extension of work currently planned by TVA to test the technology at the 10-MW pilot scale. The proposed demonstration project would not start until mid-1988. A 30-month design and construction effort is planned, followed by a 24-month test and demonstration phase. Project completion would then be anticipated at the end of 1992.

The total estimated design and construction cost for this project is \$40 million in 1984 dollars. This estimated cost is based on previous bids from several vendors for the spray dryer/baghouse retrofit at TVA's Shawnee Steam Plant at Paducah, Kentucky, which included the same types and approximately the same size equipment as a spray dryer/ESP retrofit would require, plus a 30 percent retrofit factor.

TVA proposes that DOE fund the \$40 million cost for design and construction, with TVA funding the operating and maintenance costs. A portion of the costs could be offset by vendor participation. There are no other participants at this time.

52. Question: Please provide a detailed contract by contract breakdown of the \$111.9 spent to date on the Murphy Hill coal to methanol plant. Please chronicle and detail TVA's efforts to receive funding for construction from the Synthetic Fuels Corporation.

Answer: The North Alabama coal to methanol project, located at TVA's Murphy Hill site, was accomplished through a combination of in-house and contract efforts. Attached is a list of contracts entered into by TVA for the project. The contract expenditures as of April 30, 1985, total \$66.7 million. The six contracts indicated with an asterisk have not been closed. Additional in-house expenditures amounting to \$45.3 million have been incurred as of April 30, making a total of \$112.0 million. We estimate that about \$4 million more will be spent to cover contract and personnel costs after April 30 as well as stabilization of the Murphy Hill site.

The project applied to the SFC for financial assistance under each of its general solicitations. The attached chronology details the efforts of TVA and the Consortium to obtain SFC financial assistance. The Consortium decided to withdraw the project when the SFC indicated that no further awards would be made to projects using Texaco technology. At this juncture, in cooperation with the Department of Defense, the project was placed in defense energy reserve status. The engineering design work and site improvements already completed will support a rapid startup of the project in the event of a national emergency.

TENNESSEE VALLEY AUTHORITY
OFFICE OF COAL GASIFICATION

LIST OF CONTRACTS
(As of April 30, 1985)

CONTRACTOR	CONTRACT NO.	EXPENDITURE
A-1 Barricades, Inc.	83KL2-671212	\$5,257.90
A-1 Barricades, Inc.	84KL7-695659	2,042.70
*A. B. Nix and wife	TV-56513A	6,000.00
AECI Ltd.	TV-60788A	13,417.97
Ahlstrom Osakeyhtio	83K30-636539	215,930.00
Air Products & Chemicals, Inc.	TV-54569A	8,300.00
*Air Products & Chemicals, Inc.	TV-62900A	137,036.92
Air Products (Houdry Division)	TV-63303A	27,061.00
*Atlantic Richfield Company	TV-60433A	672,852.00
Arthur D. Little, Inc.	TV-52833A	18,583.03
Arthur D. Little, Inc.	TV-53470A	53,935.35
Arthur D. Little, Inc.	TV-59724A	163,649.19
Babcock Contractors	TV-54584A	78,000.00
Baker Rental & Leasing	84K29-671215-3	6,775.00
Bechtel National, Inc.	TV-53050A	771,855.00
Beckman Instruments	TV-60076A	4,970.00
Bob Yeiser Oil	83K671201	17,267.33
Booz Allen & Hamilton	TV-52608A	38,332.93
Braun & Co. (C F)	TV-53452A	988,491.97
Braun & Co. (C F)	81K30-176666	17,368,231.61
British Gas	TV-53844A	116,200.00
Brookfield Engineering Lab	81KN7-192298	1,817.39
Brown & Root, Inc.	TV-49506A(OEDC)	31,956.27
Budget Rent-A-Car	84K29-671215-2	3,476.55
Catalytic, Inc.	TV-58355A	77,433.22
Chem Systems, Inc.	80PL7-176997	7,000.00
Chem Systems, Inc.	81KL7-636528	4,000.00
Chem Systems, Inc.	83KB6-636541	12,000.00
Chem Systems, Inc.	TV-57281A	66,763.58
Clark (E. L.)	TV-56072A	2,207.36
Cole Steel Drum/GAT Container, Inc.	84KK7-695658	516.00
Construction Tech. Labs	82KB2-636537	10,000.00
Delta Road	82K830416	280,962.83
Dreck, Jay S., Consultant	TV-60837A	11,665.00
Ebasco Services, Inc.	TV-49508A (OEDC)	63,933.66
Engineering-Science, Inc.	TV-58333A	110,158.60
Fleet Transport Co.	TV-94391A	569.99
Foster Wheeler Energy Corp.	TV-53453A	761,837.15
GKT (Krupp Koppers)	TV-53751A	97,286.18
GKT (Krupp Koppers)	TV-55298A	4,586,775.54
GKT (Krupp Koppers)	81K31-179371	16,741,646.16
Haldor Topsoe, Inc.	TV-55032A	191,134.56
HJD, Inc.	TV-58381A	26,560.00
Jack E. Gilleland	TV-51868A	5,375.25
Jackson Co., AL	TV-60417	19,022.00
Jordan, Jones & Goulding	TV-54653A	27,300.00

TENNESSEE VALLEY AUTHORITY
OFFICE OF COAL GASIFICATION

LIST OF CONTRACTS
(As of April 30, 1985)

CONTRACTOR	CONTRACT NO.	EXPENDITURE
Kidder, Peabody & Co., Inc.	TV-58204A	145,860.38
Kidder, Peabody & Co., Inc.	TV-61454A	655,374.77
Kinsler Fuel Injection	83KM3-671219	1,529.40
Life Career Development	TV-63893A	9,950.00
Lurgi Kohle and Mineral, GmbH	TV-53556A	70,000.00
Lurgi Corporation	83K30-636538	31,027.70
Mono Power Co.	TV-53642A	21,198.52
Morgan Building Systems	83KK7-671218	946.67
Mountain View Ford	83KM1-671205	8,691.82
NASA	TV-52834A	1,413,592.53
National Car Rental	84K29-671215-1	31,960.45
National Car Rental	84KM1-671176	8,968.54
Ohio Thermal	81KN7-192297	1,808.30
Ohio Thermal	81K30-192296	1,860.00
Oxygenated Fuels Assoc.	TV-61739A	15,000.00
Fort-O-Toilet	84KK7-695656 and 83KK7-671217	358.00
Project Management Group	TV-61660A	1,727.70
Radian Corporation	TV-55296A	653,623.20
Ralph M. Parsons Company	TV-52997A (OEBC)	191,338.57
*Raymond Kaiser Engineers Inc.	82K30-636529	4,425,078.08
Research Triangle Inst.	TV-57887A	169,013.63
Ruhrkohle/Ruhrchemie	TV-55759A	495,200.28
Selox, Inc.	TV-55343A	4,588.00
Service Equipment Co.	83K31-636540	56,725.20
Spencer Austin Fencing	83KK2-671203	1,311.78
*Stearns Catalytic Corp.	81K30-176666	7,221,023.72
Stearns-Roger Services, Inc.	TV-62829A	4,652,169.65
Sun Tech, Inc.	84KC3-671211	33,975.00
System Design	83K650627	1,983.48
Technical Ser. Consultants	TV-52952A	112,626.65
Texaco Development Corp.	TV-53563A	45,000.00
*TIV, Inc.	TV-55297A	795,168.78
University of Tenn. at Chattanooga	TV-48192A	26,789.01
Wakefield Community Center, Inc.	82PL6-636534	10,756.00
Wakefield Community Center, Inc.	82PL6-636535	6,873.78
Whitaker Contractors	82K831580	72,672.92
Whitaker Contractors	82K831099	148,549.58
Whitaker Contractors	82K830660	581,093.27
Whitaker Contractors	82K830433	296,141.21
Whitaker Contractors	82K830260	344,037.57
	TOTAL	66,691,181.33

*These contracts have not been closed.

NORTH ALABAMA PROJECT - SFC RELATED ACTIVITIES

- June 1979 - Congress included \$60,000,000 in TVA's 1980 appropriations to begin the planning of a four-module, 20,000-ton-per-day, commercial-size coal gasification plant.
- Summer 1980 - Through supplemental fiscal year 1980 appropriations and the fiscal year 1981 appropriations, Congress provided TVA with an additional \$150,000,000 to undertake plant design, site preparation, and long-lead-time procurements.
- June 1980 - The Congress passed the Energy Security Act of 1980, establishing the Synthetic Fuels Corporation (SFC), to accelerate the development of the synthetic fuels industry. The SFC was empowered to provide financial incentives to the private sector for commercial-scale plants producing synthetic fuel substitutes for imported oil.
- November 1980 - The SFC released its initial solicitation for proposals.
- January 1981 - The Administration proposed to rescind \$177,000,000 which then had been appropriated for the project.
- March 1981 - With the assistance of Kidder, Peabody & Co., Inc., TVA took steps to convert the project from one funded by the Government to a private sector venture with Government support. Kidder, Peabody applied to the SFC for financial assistance on behalf of the yet to be formed North Alabama Coal Gasification Consortium.
- April 1981 - Rather than the \$177,000,000 proposed by the Administration, Congress rescinded \$85,000,000, which allowed TVA to retain \$125 million to develop the project before transferring it to a private sponsor. The Government's investment in the project was to be repaid with proceeds from the project, with interest.
- December 1981 - The SFC announced the proposals being considered in Phase I for the First Solicitation. The project was in this group. More formalized evaluation criteria for proposals were announced.
 - The Second Solicitation was also announced which identified four areas for competitive evaluation of proposals.
 - Air Products and Chemicals, Inc., Santa Fe International, and Kidder, Peabody executed an interim consortium agreement.
- January 1982 - The Consortium's application to the SFC was updated, reducing the plant size to one module of 5,000 tons of coal per day.
 - The project passed the SFC's maturity review for First Solicitation proposals.

- March 1982 - The SFC board concluded that the project did not pass the First Solicitation strength test so the project did not proceed into negotiations. The SFC specified that an incomplete Consortium, lack of market, and economic factors led to the board's action. Subsequent discussions indicated that ownership of Santa Fe International (a Consortium member) by Kuwait Petroleum was a major factor.
- July 1982 - The project passed the Second Solicitation maturity test.
- August 1982 - The Third Solicitation was released by SFC for oil shale, coal, and tar sands/heavy oil proposals.
- August-September 1982 - Raymond International, Inc., Houston Natural Gas Corporation, and Peabody Coal Company joined the Consortium. Santa Fe International remained in the Consortium, but not as an applicant for SFC assistance.
- September 1982 - The project passed the SFC's Second Solicitation strength test and was required to produce a level II/III design and cost estimate by November 30.
- January-February 1983 - The SFC and the Consortium engaged in negotiations toward a letter of interest and intent. The negotiations floundered due to the large amount of funding support requested, marketing questions, and lack of remaining equity.
- April 1983 - The SFC moved the project from the Second Solicitation to the Third due to lack of progress in the negotiations.
- May 1983 - Discussions with the SFC suggested that the project be restructured at a smaller size with a different financing and assistance request. Design work was initiated to reduce the plant size to 3,400 tons of coal daily.
 - The project passed the SFC's strength test for the Third Solicitation.
- August 1983 - The Consortium was restructured with Air Products as the lead member. Santa Fe International was dropped. The remaining members accounted for 90 percent of the required equity.
- January 1984 - The Consortium switched from the K-I technology to Texaco to reduce plant capital and operation costs.
- March 1984 - The SFC staff reviewed the Texaco-based engineering that had been completed and determined that it did not meet their Level II/III requirements.
- April 1984 - The SFC Board dropped the project from the Third Solicitation.
- June 1984 - The Consortium reapplied to the SFC Fourth Solicitation.

- December 1984 - The SFC staff reviewed the final Texaco-based engineering and concluded that it met their Level II/III requirements.
- January 1985 - The SFC board deferred qualification of the project under the Fourth Solicitation until its February meeting.
- February 1985 - The SFC board announced a business plan which indicated that it would not make further assistance awards to projects using the Texaco technology.
- The Consortium withdrew the project from SFC consideration and TVA placed it in defense energy reserve status.
- April 1985 - TVA asked OMB to propose to the Congress to defer the \$9,000,000 which was not required to conclude the project site restoration and engineering.

53. Question: Realizing every public or private organization has its failures, what TVA nonpower programs have failed to live up to expectations since 1933? Have these experiences proven valuable in the sense of preventing future mistakes?

Answer: Within most of our major programs we have had particular activities which from time to time did not meet our expectations. Through the flexibility provided to the Board by the Congress, however, we have been able to restructure or eliminate activities and institute new ones within major programs to address the changing needs of the people in the Valley. In every case such failures and corresponding program adjustments have provided valuable experience for TVA managers and the Board of Directors, as well as other organizations across the Nation. It is this flexible approach that has enabled TVA to react to changing conditions in the Valley region and modify its activities to ensure a greater chance of success.

The following describes some of TVA's historic activities within major programs which did not meet TVA's original expectations.

Agricultural Resources Development

1. Soil erosion--TVA's initial objectives to control soil erosion, restore soil fertility, and increase farm income were successfully accomplished by demonstrating the value of improved farm production practices, targeted soil fertility and fertilizer development research, and establishment of cooperative ventures to supply improved inputs and needed services (i.e., terracing associations). However, this early success was short lived because the efforts did not prove to be lasting solutions to the problems in the Nation's very dynamic, competitive agricultural sector.

Following World War II, TVA's agricultural program emphasis shifted to more systematic farm planning, enterprise analysis, and intensive agricultural development and economic adjustment. In general, these programs focused more on resource allocation decisions and short-run profitability and less on the quality, adequacy, and capability of the resource base than had TVA's earlier programs. With a new generation of farmers, the industrialization of U.S. agriculture, and other changes in the structure and organization, the dramatic shift in the Valley from forage-based livestock production and forestry on erosion-prone land to erosive soybean (and other feedgrains) production of the 1960s and the 1970s was unanticipated and largely unobserved until soil erosion had once again become a problem of major magnitude. The early institutional and educational efforts simply failed to be lasting solutions because of changing agricultural conditions.

The real lesson learned is that a short-run economic adjustment focus will seldom, if ever, provide solutions to long-term resource conservation problems, and program design and implementation should be focused on identifying emerging problems rather than reacting to observed crises. Research and analysis must be maintained to assure that policies and programs are of sufficiently broad orientation to assure that long-term perspectives balance individual needs with the needs of society.

2. Farm machinery--The small farm machinery development program conducted during the thirties was based on the dominant view that nonagricultural employment would continue to be limited and that it would be necessary to develop tools, machinery, and enterprises that would fit small-farm, marginal agriculture. This program did not live up to expectations because the economy grew rapidly both during and after World War II. Nonfarm employment opportunities were plentiful, agricultural technology grew rapidly, and labor was released from marginal agriculture. Agricultural growth occurred in more productive areas on more economic sized units.

From this experience we learned that programs must be continuously reviewed within the context of the economic conditions of the time and the region. We have continued to observe this lesson and maintain a close relationship with many constituency groups, as well as institutions and agencies, in our planning.

3. Agronomic-economic research program--This program, conducted during the 1953-1963 period in cooperation with six land-grant universities, did not live up to its expectations. The goal was to establish multiple regression equations that would predict crop yield as a function of such variables as soil tests, rates of individual plant nutrients in fertilizers, climate (such as rainfall), etc. Much was learned about statistical techniques such as experimental design, models, curve fitting, interactions, plot size, etc., but the main goal was not reached because of the unexpected importance of site and season specificity. For example, there did not seem to be a mathematical way to predict the yield response of corn as a function of nutrient rates and soil test levels for future seasons over a general soil region. It was concluded that there are too many variables operating in this system that defy quantifying in any meaningful way. Results from agronomic studies conducted as part of this research, however, did lead to improved fertilizer recommendations. TVA now makes such recommendations empirically, as opposed to being done mathematically as originally proposed.

National Fertilizer Development

1. Elemental phosphorus--TVA's efforts to develop fertilizer products and processes based on elemental phosphorus did not

meet expectations. A number of very high analysis, excellent fertilizers were developed in the postwar years. However, as the price of energy increased dramatically, it became economically infeasible to use elemental phosphorus as a source of phosphate for fertilizers. Therefore, TVA process programs were reoriented for the use of more economical means of producing phosphate. TVA's efforts changed to the use of sulfuric acid and phosphate rock to produce a wet-process phosphoric acid which is now an economical source of phosphate for production of many types of fertilizers. Although fertilizer based on elemental phosphorus did not achieve widespread acceptance, the experiences were valuable.

Some examples of positive "spin-offs" from the use of elemental phosphorus are:

- The production and introduction of 11-37-0 liquid fertilizer (made with elemental phosphorus) was a major factor in creating the liquid fertilizer industry.
 - Work in this area later led to the development of technology by which less expensive wet-process phosphoric acid could be used to make comparable grades of high-quality liquid fertilizers.
 - TVA's production of both concentrated superphosphate and diammonium phosphate (21-53-0) based on elemental phosphorus created major markets that subsequently were met with slightly lower analysis products made with the less expensive wet-process acid with TVA-developed technology.
2. Calcium metaphosphate--On the other hand, another product, calcium metaphosphate, based on the use of elemental phosphorus, never made the grade. It was very high in plant food content (0-62-0) but turned out not to be feasible. Fused tricalcium phosphate produced in a blast furnace also proved to be impractical. Its energy cost was too high and its physical form was not readily accepted.
 3. Nitric phosphate--TVA has developed fertilizer production processes involving reacting phosphate rock with nitric acid, but industry adoption of these processes has not met our expectations. The nitric phosphate processes do not require sulfur and have lower production costs than conventional phosphate fertilizers at many locations. Sulfur prices are cyclical, however, and fertilizer industry interest in nitric phosphates rises and falls with sulfur prices.

Natural Resources and Economic Development

Design, construction, and early operation of the TVA reservoir system did not address all potential benefits of the system. The

result was that in meeting the statutorily required primary purposes of navigation, flood control, and hydroelectric power generation, sacrifices were sometimes required in other areas. Recreational and tourism interests, fisheries and wildlife values, and commercial and industrial forces often clash with existing uses and compete for future advantage. To broaden as much as possible the benefits for which reservoirs are operated and still meet statutory requirements, TVA made extensive changes in operating guide curves about 1970. This affected most tributary reservoirs. At present, additional studies are being made to see if further changes are possible in operating procedures.

1. Dissolved oxygen—When most TVA dams were built in the 1930s and 1940s, turbines, sluices, and spillways were designed according to the practices of the day. Little information was available generally on how man-made reservoirs functioned with regard to stratification, aging, and dissolved oxygen characteristics. By the 1960s, however, TVA recognized that oxygen depletion during the warmer months might cause problems in streams below many dams. Nationwide it has been estimated that about 1,000 reservoir projects may cause problems for downstream uses.

Regulating sleeve valves were installed by TVA in a few later projects to improve the oxygen content. Then, in the 1970s, a national demonstration of ways to improve oxygen content of reservoir releases was launched. At the same time, as hydrogenerating turbines were replaced, aeration capabilities were designed into them. A demonstration program of reservoir aeration was launched. A minimum stream-flow demonstration was also begun, using in one instance a reregulating weir in the stream below the dam and in the other a small hydroturbine to generate electricity from discharges that would otherwise bypass the generating units.

Reservoir releases improvements have been implemented in various stages at the following reservoirs: Norris, South Holston, Cherokee, Douglas, Tims Ford, Fort Patrick Henry, Boone, Pickwick, and Upper Bear Creek Dams.

2. Water quality monitoring—TVA followed a successful 1960s series of intensive water quality surveys on the mainstream Tennessee River reservoirs with a Valley-wide ambient monitoring network in the 1970s. This network was intended to provide current information on water quality throughout the Valley in order to identify problems and document improvements. Although it did provide much useful data, it failed to meet the expectation of providing current information Valley-wide. The number of stations, frequency of sampling, and amount of data analysis required to meet this objective far exceeded available resources. Stations in the network provided information on water quality in reservoir inflows and outflows, but not on quality within reservoirs. Many of the parameters monitored provided little useful information

related to suitability for desired stream uses. As a result, the TVA ambient monitoring network was dropped in 1979, with the expectation that we could rely on other Federal and State agency monitoring programs and a few intensive surveys each year to provide data for water quality management decisions. That approach has also proven inadequate. As a result of tight budgets in the 1980-1985 period, other agencies have reduced their monitoring programs and tailored the remaining programs to much narrower objectives.

Drawing on these experiences, TVA has begun a new monitoring program which focuses on identification of water quality issues and on suitability of Valley waters for desired uses. The new program includes several self-correcting features designed to make it a dynamic, evolving program, in contrast to the static network in place during the 1970s.

3. Reservoir ecology--An example of a temporary setback in the reservoir ecology program occurred between 1962 and 1964 when attempts to chemically eradicate Eurasian milfoil from all Valley reservoirs failed. As a result of this experience, TVA developed an effective control program for milfoil in Valley reservoirs, and a prevention and early detection strategy was set up for other undesirable aquatic plant species.
4. Fisheries--A temporary setback in the fisheries program occurred in the 1960s when extensive attempts to develop commercial fishing gear failed to produce an economically feasible large-scale harvest method. As a result of this failure, TVA gained a better understanding of the economics involved in harvesting and marketing fish in the Valley and was able to tailor future programs to more effectively deal with local harvesting and marketing conditions.

Another temporary setback in the fisheries program occurred in the late 1930s and early 1940s when hatcheries and nursery ponds were built to stock native fish into newly constructed TVA reservoirs. This was done on the premise that native fish would not reproduce in the reservoirs. As it turned out, fish did successfully spawn in the reservoirs, and the hatcheries and nursery ponds were not needed. As a result of this experience, the agency gained valuable experience in the management of reservoir fisheries and went on to pioneer research and develop the framework for regulations now used by the Valley States for managing reservoir fisheries.

5. Forestry--In forestry, a major undertaking was begun in 1962 to reforest all idle lands in the Valley in 7-1/2 years. The desired objective was not reached, primarily because of a lack of landowner incentive to plant trees. There was an

inadequate market for timber products and the venture was long term, with little hope of returns for two decades or more.

The woodland resources allocation procedure was designed to optimize management of forest land for both timber and wildlife. This was a concept with outstanding merit but which became unworkable because research data required for specific portions of the system were either unavailable or were held by groups unwilling to make it available. Attempts to go forward in spite of these handicaps proved unworkable. However, this very complex approach was later broken down into more simple components, and a new program--WOODPLAN--became a major breakthrough in forest management.

6. Wood pyrolysis--TVA attempted to refine and demonstrate a prototype pyrolysis unit that was deemed by the manufacturer to be capable of efficient and effective conversion of waste wood, an abundant commodity in the Valley, to charcoal for sale, oil to fire an existing boiler, and low-Btu gas to run the unit. With many applications readily available, TVA's strategy was obvious: demonstrate the machine for these applications, promote investment in the technology, and thereby develop a strong market for low-quality wood while providing large savings in energy costs for Valley firms and institutions. The machine was modified substantially, but was never perfected and failed in sustained operation.
7. Wildlife--In the wildlife program, projects which did not meet expectations include induced migration in giant Canada geese and reimbursement to private landowners for their expenses in maintaining wildlife habitat in TVA powerline rights of way. However, each of the projects provided valuable knowledge regarding techniques which could be modified to produce more desirable results. Attempts to induce migration in giant Canada geese, for example, were terminated because of concern that the birds would come into contact with avian influenza and inadvertently spread the disease. Because of termination of the project, this occurrence was prevented, and the result of the cooperative effort was a permanent flock of geese being established in Georgia. Work with private development of powerline rights of way showed that the TVA maintenance procedures, when properly applied, provided a more cost-effective and environmentally beneficial result than did reimbursement of private landowners.
8. Environmental/energy education--An effort to organize local school systems into educational cooperatives to support environmental and energy education initiatives failed to live up to expectations. Initiated in the early 1970s, the strategy tended to be supported as long as available TVA funding was substantial. The coalitions tended to dissolve when fewer TVA funds were available. A fundamental problem was the

lack of a solid administrative base and poor financial management skills within the cooperatives. Although remnants of these efforts remain successful in north Alabama and upper east Tennessee, the overall strategy was revised to focus on regional universities as outreach mechanisms to schools in the Valley.

9. Land reclamation--During the 1950s and 1960s TVA encouraged voluntary reclamation of coal mine land. TVA provided free tree seedlings as well as technical reclamation assistance to landowners and coal companies. However, we found voluntary reclamation was not the answer. Thus, beginning in 1965, TVA required its coal suppliers, through contractual commitments for coal purchases, to reduce the adverse effects of coal mining on land and water resources. Contract reclamation requirements for companies supplying coal to TVA were strengthened in 1968, 1970, and 1971. Because of prior experiences, TVA also joined with States and others to promote appropriate legislative controls, particularly Federal reclamation legislation.
10. Skills development--A past weakness of TVA's skills development program was its inability to transfer knowledge gained to State or local training agencies. For example, during periods of peak construction, when large numbers of skilled workers were required, TVA unilaterally developed training programs without the help or cooperation of other agencies. Consequently, when the training came to an end, very little impact was made on State and local training agencies which could have benefited from TVA's experiences. This approach did not provide a way for TVA expertise to be shared and transferred to agencies which would have enabled them to use the knowledge for future program development.

Today, all TVA skills development activities work in cooperative partnerships with State and local agencies. This relationship maximizes the sharing of knowledge and expertise from agency to agency and enhances State and local training programs which operate in support of economic development activities. No projects are implemented without commitments of financial or technical assistance from State and local officials. As a result, information is shared.

Projects that ended with less than totally satisfactory results served as valuable lessons for improving chances for success in the future. This has been borne out by the very favorable overall rate of successes. TVA will always be able and willing to take on programs that have associated risks, because one of the agency's roles is to break new ground in bringing modern ideas and technology to fruition.

54. Question: Please describe what you think are some of the major successes and achievements of the nonpower programs since TVA was created in 1933.

Answer: Some of the major accomplishments and successes of TVA's nonpower programs, arranged by major program, are:

National Fertilizer Development Program

Most of the 50 million tons of fertilizers used annually by U.S. farmers are based on technology developed at TVA's National Fertilizer Development Center. Seven of the most significant TVA developments and savings from their use are described below.

The cone mixer for superphosphate is a simple, low-cost, funnel-shaped cone for mixing phosphate rock with sulfuric or phosphoric acid to reduce normal (20 percent P_2O_5) or triple (46 percent P_2O_5) superphosphate. The mixer has no moving parts and has very low capital operating and maintenance costs. This development was adopted as the standard for the U.S. superphosphate industry. Estimated production cost savings since introduction in the 1940s is about \$54 million.

Aside from concentrated superphosphate, which already was produced in limited quantity, ammonium nitrate was the first big TVA fertilizer product success. Working with the U.S. Department of Agriculture and a private company, TVA helped develop a process that made this potentially explosive material safe for fertilizer use. TVA then led in introducing ammonium nitrate nationally during the mid-1940s. It was a major factor in increasing U.S. food production to help alleviate world hunger in the postwar era, and rapidly became the leading nitrogen fertilizer. With twice as much plant food per pound as the nitrate of soda that it replaced, the switch to ammonium nitrate has saved farmers millions of dollars.

In the continuous ammoniator-granulator process developed by TVA, homogenous granular-mixed fertilizers are produced from raw materials such as ammonia, phosphoric and sulfuric acids, superphosphate, and potash. In this process, they are mixed in a rotating horizontal drum, reacted, and granulated. The process is used to manufacture about 8 million tons annually of granular-mixed fertilizers in the U.S. Cost savings accrue from increased production rate, lower cost raw materials, and decreased cost of drying materials. Estimated production cost savings since introduction in the 1950s are about \$4.4 billion.

Bulk blending is an important segment of the fertilizer industry. The concepts and procedures necessary for its rapid and successful growth were pioneered by TVA. Bulk blending is the physical blending of granular fertilizer materials to yield desired amounts of plant nutrients. All materials are handled in bulk (instead of more costly and labor-intensive bags) and processing

costs are less. Estimated savings since early 1960s are about \$1.4 billion. Important additional savings to the farmer from prescription blending to meet exact nutrient requirements are not included in this estimate.

The diammonium phosphate (DAP) process for producing a 18-46-0 grade diammonium phosphate was developed by TVA. This fertilizer process is superior to an industry-developed process. When introduced, the TVA process doubled output from a given size plant. Moreover, the fertilizer had superior storage and handling characteristics. Cost savings from increased plant capacity since 1963 are about \$1.8 billion.

This process and the resulting economics of manufacture and distribution made bulk blending of fertilizer mixtures possible. Bulk blending quickly became the dominant method by which mixtures were supplied. Today it accounts for nearly 50 percent of all mixtures sold.

Suspension fluid fertilizers are fertilizers in which very small particles of fertilizer salts are suspended in a fluid mixture. Special processing techniques keep particles from settling. As compared to liquid fertilizers, this system allows production of higher analysis product, use of lower cost intermediate materials, and makes possible special formulations which include insoluble micronutrients or herbicides. Cost savings result from use of low-cost raw materials, higher analysis products, and incorporation of insoluble additives. Estimated savings in the U.S. are about \$637 million.

The pipe reactor is a simple low-cost piece of equipment for reacting ammonia and phosphoric acid to produce fluid fertilizers. Savings result from a low initial cost. Also, fertilizer with high polyphosphate content can be manufactured with lower cost phosphoric acid by using the chemical heat of reaction. Estimated savings are about \$85 million. More than 100 of these plants are operating in the U.S. and benefits are still accruing.

The pipe-cross reactor is a variation of TVA's pipe reactor technology which permits ammoniation of both sulfuric and phosphoric acids and produces a granular fertilizer requiring little or no drying. Cost savings are principally from reduced energy requirements for drying and eliminating pollution control requirements. About 30 plants use this process. Estimated savings are about \$182 million.

The TVA technology transfer process itself must be classed as a success. Although there are many facets of the process, the evolution of the introduction program is worth noting. Initially TVA began producing improved fertilizer--concentrated superphosphate--and introduced it to farmers in the Tennessee Valley region. TVA encouraged formation of local groups of farmers to handle distribution of the fertilizer. Gradually these grew into farmer cooperatives, which became a key in the introduction program. Then, in 1950, in response to interest, TVA began making

its experimental fertilizers available to private firms for testing and market introduction. Thus, for many years we have worked with every segment of the fertilizer industry to introduce new technology.

The ammonia-from-coal project is another success. It originated at the request of the fertilizer industry at a time when it appeared that shortages of natural gas would soon threaten nitrogen fertilizer production, and thus food production. Fortunately, that threat has not materialized to date, but the project has shown a viable alternative to reliance on natural gas for ammonia production. It also has attracted considerable interest in the chemical and energy industries. Now the project is being reoriented to additional nonfertilizer experimental development.

TVA researchers have contributed more to the understanding of the chemistry of reactions between phosphate fertilizers and soils and their effects on crop growth than any other research group. When this research began in 1955, these reactions were thought to be a liability. Numerous research activities over a 15-year period provided most of the current knowledge about reactions of fertilizers in soils, and this knowledge was used to advise farmers about what kinds of fertilizers to use and how to apply them. This research also led agronomists to a gradual realization that these reactions were not a liability, but actually conserved phosphate in the soil and provided a reservoir for future use by crops. This led to a 10-year field research program, with 10 universities cooperating, which proved that the buildup of phosphate in soils through past fertilization could provide adequate phosphate for good crop yields for several years. These results have been built into the fertilizer recommendations by several of the cooperating States.

The impact of this research can be assessed by examining review articles on soil-phosphorus interactions, in which TVA papers often account for from one-fourth to one-half of the total papers cited.

Although the forest fertilization research program was largely a two-man operation, no other research effort has had more impact on its field of study. When this program was initiated in the early 1960s, there was very little forest fertilization and virtually no research on this practice. In the 17-year life of this program, 30 extensive field experiments were established on TVA lands, and numerous experiments through the universities; cooperative programs among the forest industry, universities, TVA, and other agencies were started in all major forestry regions; and research programs were established in the major schools of forestry. The program was discontinued after forest fertilization had been firmly established as a sound practice and industry and university researchers had developed the capabilities for continued research--the latter largely due to TVA's catalytic role.

National Energy Demonstrations

Atmospheric fluidized-bed combustion (AFBC) projects--TVA is playing a leadership role in the development of AFBC as a power generation option for the Nation's utilities. AFBC is an advanced coal combustion process that will cleanly burn high-sulfur coal.

To achieve rapid commercial acceptance by the utility industry, this technology needs a utility-scale demonstration to verify reliability, performance, and costs. The first major step leading to a utility-scale demonstration has been taken by constructing a 20-MW AFBC pilot plant at the TVA Shawnee Steam Plant in Paducah, Kentucky. This facility cost \$68 million to construct, with \$36.4 million coming from appropriations and the balance from TVA power funds. The unit began operations in May 1982. Major test program objectives are to develop the economic, technical, and environmental performance data for the technology to be used in the design and construction of the demonstration plant. The unit has operated over 11,000 hours.

Results from these successful tests have been used in design and warranty decisions for a 160-MW demonstration plant now scheduled to be online for TVA by 1989.

Agricultural Resources Development

The TVA agricultural program, initiated in 1933, literally turned agriculture around in a few years from a destructive cash crop economy with low productivity and low income to a long-term sustainable diversified agriculture. There are few examples in world agricultural history to match the favorable impact that the program had in improving the livelihood of the population of one of the poorest regions in the U.S.

By World War II more than 582,000 acres had been terraced, and row crop acreage had decreased by 22 percent, while pasture acreage increased 32 percent. The task of stopping soil erosion was, at that time, considered to be largely accomplished. Use of phosphate fertilizers had increased from 14 to 523 pounds P_2O_5 per open acre and use of lime had increased from 1.9 to 8.9 tons per open acre. Net farm income increased 264 percent.

Another success story is the development of local cooperatives to distribute TVA fertilizer and administer the test-demonstration program initiated soon after TVA was organized in 1933. These locals were the forerunners of many of the federated co-ops operating in the Valley today. Tennessee Farmers Co-op and Alabama Farmers Co-op were direct outgrowths of the locals started through the TVA program. In other States many of these locals are now affiliated with other regional cooperative associations.

Soil conservation—Soil erosion again became a serious problem in the western portion of the Tennessee Valley region in the 1970s. In 1979 a multiagency management and conservation educational program was initiated in 21 west Tennessee counties to reduce soil erosion, improve water quality, and maintain farm productivity. The six-phase program has been highly successful in gaining the attention of farmers and landowners. In 1983 an estimated 8,300 people attended 37 educational meetings and field days.

By the end of 1983 there were 142 resource management conservation (RMC) farms enrolled in a program demonstrating how conservation farming can be practiced while maintaining farm income. By 1983 the first group of RMC farms, over a five-year period, reduced soil loss per cropland acre from 18.4 to 6.3 tons per acre based on calculations using the universal soil loss equation.

Overall it is estimated that soil loss in the 21 participating counties has been reduced 4 tons per cultivated acre as farmers have become more aware of soil loss and how to manage land to prevent it. For example, no-till and other conservation tillage has been found to be cost effective by many farmers, and its use is increasing rapidly.

Last year the program was expanded to the 201 Valley counties, with TVA coordinating the multiagency effort.

Parker Branch watershed—In 1953 TVA, North Carolina State University, and 49 landowners undertook an experiment in the 1,060-acre Parker Branch watershed. The experiment was to determine the extent to which farm income could be raised and to measure the resulting change in farming on the hydrology of the watershed.

Parker Branch was poor in 1953. The land was poor and so were the people. Two-thirds of the watershed had lost 75 percent or more of its original topsoil. As the land became less productive, crop yields slipped and incomes went down.

The program involved working with the farmers to modernize farming practices, reclaim the land, and change land use. Taking advantage of the latest electronic computing equipment, farm management specialists made detailed plans for developing high-income farming systems.

By 1961 average net farm income had increased from \$400 in 1953 to \$1,500 per year. The higher rate at which moisture was absorbed into the soil, resulting from improved conservation practices, reduced the runoff from summer storms by 50 to 60 percent and lengthened the time required for this runoff to reach the stream. Stream sediment resulting from topsoil erosion was cut from 3.1 to 1.1 tons per acre per year. When private capital was valued at 6 percent, returns for public capital for farm planning assistance ranged from 16 to 22 percent.

This project was designed to be a national demonstration to show what could be accomplished with twin goals of improved farm income and watershed hydrology. To serve this purpose, measurements were taken and information collected at each phase of the project for an intensive evaluation. The results were widely disseminated through professional journals, articles, and a movie.

Agricultural development, rapid adjustment farms—Agriculture was undergoing major technological changes in the late fifties and early sixties. TVA established the rapid adjustment farm program in 1961. These farms were selected to serve as laboratories where new technologies could be rapidly applied on working farms and demonstrated to professional agricultural workers to show them the value of applying new planning techniques and developing new approaches to application of new technology. The planning techniques applied and demonstrated on these farms were taught to a high percentage of agricultural professionals in the region. That program formed the real base for support of increased efforts in farm management work in all States in the region and also led to formation of self-supporting farm management associations.

Watershed development programs—Comprehensive demonstration programs were conducted in 16 organized tributary areas to speed development and use the motivating force of local leadership. TVA worked with the people in the areas involved to identify opportunities, set goals, and seek solutions. Program success was dramatic. The agricultural program in Beech River watershed, for example, involved two counties. Programs involved efficient use of fertilizer, production practices for row crops and forages, and improved farm management. Yields more than doubled.

Land use shifts almost eliminated row crop production on marginal uplands, and about 12,000 acres of severely gullied, highly erosive land was reforested. Gross farm sales increased from \$5.8 to \$8.3 million and sales per farm increased from \$1,700 to \$3,800. There was a 250-percent increase in the number of farms with sales of \$5,000 or more, showing a significant increase in the number of commercial farms. The \$2.5 million increase in gross farm sales increased total business activity by \$8.75 million annually. Similar results were obtained in other areas. The Elk River tributary area program, conducted between 1963 and 1968, is another example of area impact. The program included seven counties in Tennessee and two in Alabama. One aspect of the Elk River program involved promotion and development of feeder pig enterprises. Four specialized markets were developed in the watershed. The number of feeder pigs sold increased from 16,700 in 1961 to 177,000 in 1966. Value of sales increased from \$226,000 to \$1,156,000. Similar successes were made in each of the 16 areas. In addition, the people learned the value of working and planning together to help themselves reach common goals.

Soybean marketing--A study of optimum location of soybean processing facilities resulted in the development of a 2,500-ton-per-day facility located at Decatur, Alabama, that employs 300 people in the plant. The plant and associated Valley assembly elevators provided a major new market for soybeans that was being demonstrated as a profitable cash crop alternative to corn and cotton. The soybean plant location study also provided the basic data for new plants located in north Georgia, North Carolina, Memphis, and several in the Midwest. The study was also used by firms interested in locating facilities in the Northwest and Northeast.

Vegetable production and marketing--A more recent effort in cooperative development resulted from the need to establish infrastructure to support an emerging vegetable industry. TVA has identified vegetable crops as one of the commercial alternatives for farmers in the Valley region who are now producing tobacco, dairy products, and other commodities that are in surplus supply. Ten co-ops have been organized in the region, and most of them are participating in a newly organized federation that should help stabilize the supply of quality vegetables throughout the harvest season. While some of the local co-ops may not succeed in their present form, a high percentage will likely be successful with appropriate development of their management and marketing skills. Sales from these 10 local co-ops are over \$5 million, and they are growing in membership and in acreage devoted to vegetable production.

New sources of income in western North Carolina--In the past few years many areas of the Valley have faced serious agricultural income problems while attempting to compete in traditional crops, such as feed grains, cotton, soybeans, and tobacco. This problem was foreseen more than a decade ago by farmers and agricultural leaders in several counties in western North Carolina. The TVA agricultural program, in cooperation with North Carolina State University and North Carolina Agricultural and Technical State University, was revamped to focus on the introduction of new enterprises. The integrated strategy involved research to find the best varieties and production practices for local conditions, farm demonstrations to show other farmers how a profitable system could be put together, and market development to provide for an orderly expansion of markets.

The program has been extremely effective in identifying and developing new income sources for farmers with very limited acreages. For example, cooperative demonstrations were begun in 1957 to show the potential for producing vine-ripened tomatoes in the area. Two acres of tomatoes were grown commercially that year. Today more than 1,200 acres of tomatoes in western North Carolina are producing about \$15 million per year. Similar demonstrations were conducted with commercial production of Christmas trees and ornamental shrubs. Today they are adding another \$20-\$25 million of income in the area. These cooperative programs helped this 15-county area increase its gross farm income much more than the State--76.3 percent versus 43.5 percent over a recent five-year period.

Productive use of waste heat--In the 1970s TVA conducted a program to integrate the feasibility of using waste heat from power plants for greenhouses, livestock housing, grain drying, soil heating, and aquaculture. Some benefits of this effort are: (1) it called the Nation's attention to the need and possible opportunity to make use of this energy being lost, (2) it demonstrated how to do this at both coal-fired and nuclear power plants, (3) it was done using a multidisciplinary project team approach, and (4) the work was well documented. Now the results of this work are being used regionally, nationally, and internationally. Since it is likely that energy prices may start climbing again in the 1990s, its use will increase even more.

Sludge disposal--In 1973 the city of Florence asked assistance of the TVA staff to help in meeting current regulations in disposal of sewage sludge. The proposal was to use sludge on nearby cropland for soil amendments and to avoid expansion of both dewatering beds and landfills. At the time the State of Alabama did not permit land disposal, although it was being used in a few States and other countries. TVA provided information was used to assist the city to design a workable land disposal system and to convince the State to permit the city to proceed under the condition that TVA monitor and report environmental impacts. TVA's unique combination of specialists in many fields, including soils, crops, economics, environmental, water quality, etc., made an integrated analysis of the problems and helped the city and the State solve or avoid them without harm to others.

The application of sludge to cropland is now becoming an accepted practice in the State of Alabama and the Tennessee Valley region under certain conditions. TVA continues to have an interest in application of sludge as a low-cost method of disposal of waste and as a valuable recoverable resource to use as a soil amendment and source of plant nutrients. We continue to do research on agronomic response and to provide information and expertise to local systems to determine if local soils and other conditions can be adapted to the method. Information generated in the project has been publicized in national journals.

Livestock feed from agricultural waste--Since 1977 TVA, through in-house research and contractual research with the Department of Animal and Dairy Science at Auburn University, has developed livestock feedstuffs from agricultural wastes. Some benefits from this work are:

1. A substantial reduction in the cost of producing beef cattle (this appears to be as much as one-third of variable costs as compared to conventional rations).
2. An increase (more than double) in the price broiler producers are receiving for their manure from poultry houses. To emphasize the magnitude of this impact, for each \$1 increase per ton received for the litter, an additional \$1.5 million of income is realized for broiler growers in the State of Alabama.

3. Efficient resource recovery from these wastes, which greatly minimize traditional disposal costs and minimizes environmental pollution.

In the mid-1970s TVA developed a project to recycle nutrients from livestock waste. Some benefits of this work are that it: (1) reduces environmental impacts of livestock waste, (2) produces feed (algae, etc.) for fish (carp, Tilapia, shrimp) and food (water chestnuts) for people, and (3) substitutes a biological waste recycling system for a traditional mechanical system, which will increase resource use efficiency and reduce stress on resources for future generations.

Natural Resources and Economic Development

Perhaps TVA's greatest success has been in the integrated management of water resources in the Tennessee Valley. This world-recognized success includes not only design and construction of the reservoir system, but also regional operation and management of the completed system and its associated water resource. TVA's ability to identify regional water problems, assess priorities, evaluate alternatives, demonstrate innovative technologies, and serve as a catalyst in overcoming institutional constraints has resulted in more efficient resource management and greater benefits to the public. Examples of specific achievements include: technical input in the initial and continued development of State and Federal environmental laws, standards, and criteria; studies on the effect of impoundments on water quality and demonstrated methods for incorporating the findings in reservoir operating and waste management procedures--in a manner consistent with institutional constraints; control of soil erosion and land reclamation to preserve reservoir capacities and protect beneficial water uses; technical assistance to regulatory agencies to correct critical pollution problems such as DDT contamination near Triana, Alabama, mercury contamination in the North Fork Holston River, and toxic contamination in Chattanooga Creek; and water resource operation decisions which have saved communities like Chattanooga, Lexington, and Dickson, Tennessee, millions of dollars in water supply and wastewater treatment costs.

In the fisheries management area, one of the more notable successes was the fish attractor program and shoreline fishing facility development in the late 1970s and early 1980s. As a result of TVA's successful demonstration of benefits, four of the Valley States have implemented extensive fish attractor placement programs. TVA remains in this activity solely in an advisory role. These efforts have received positive public reaction and improved fishing for Valley residents. The management of lake levels to enhance fish production and the use of reservoir operations to control aquatic plants and mosquitoes has been beneficial.

The reservoir releases improvement program has been successful in improving trout fishing in the Morris tailwater by increasing the levels of dissolved oxygen in releases from the dam and by increasing minimum flows in the river. As a result, use and harvest in the tailwater continues to increase substantially.

A widely recognized success is our pioneering work in floodplain management. By the early 1950s TVA recognized that structural flood control projects alone were not an adequate answer for dealing with flood damages. The concept of using local land controls to avoid unwise development of floodplains was translated into action by providing local governments with encouragement and technical assistance to begin using this approach. From this experience TVA recognized the nationwide need for such an approach and reflected this in a 1959 report to the Congress entitled "A Program for Reducing the National Flood Damage Potential." Through this and subsequent floodplain management efforts, TVA has provided leadership and guidance for the Nation's increasing reliance on nonstructural approaches to flood damage reduction.

A major achievement since the TVA reservoir system was built was the controlling of destructive floods that had ravaged the Valley. Flood damages averted in the Tennessee Valley and along the lower Ohio and Mississippi Rivers since TVA was created now total \$3 billion. This reservoir system provides a 650-mile navigation channel stretching from Paducah, Kentucky, to Knoxville, Tennessee, which has proven to be a major economic stimulus for Valley communities. To date, private industry has invested about \$5 billion in waterfront facilities. These facilities have employed as many as 45,000 people. That figure dropped below 35,000 in 1983 largely because of the recession. However, employment is beginning to return toward prerecession levels now that business activity at waterfront industries is regaining momentum. In 1984 there were ten new industrial plants and eleven expansions of existing firms which resulted in \$186 million of new capital investment on the waterway. TVA estimates the overall net effect of this industrial expansion will result in about 700 new jobs.

The Tennessee River also provides substantial transportation savings to water shippers throughout the Valley. On an annual basis, the Tennessee River carries about 25 to 30 million tons of raw materials. The primary commodities are coal, chemicals, grains, and aggregates. In 1983 freight traffic on the Tennessee River was about 28 million tons. Estimated "shipper savings" based on 1983 tonnage was about \$161 million. Rail shippers also benefit from the availability of barge-competitive rail rates.

One of the more notable successes of the regional air quality management program has been the information generated by the trend monitoring network. The information on the background levels of ambient air quality in the Tennessee Valley has been used by regulatory agencies in developing air quality control

strategies and permits for industrial development. The information has been used by TVA and scientific research organizations to evaluate trends in air quality, determine sources influencing the trends, evaluate environmental impacts, and identify air quality problems. These are the only background air quality trend monitoring stations in the southeastern United States.

TVA pioneered the use of instrumented aircraft to study the atmospheric conversion and transport of pollutants from large fossil-fueled combustion sources. Additional information on the mechanistic details of the chemical transformation of these pollutants was provided by laboratory studies conducted in a large smog chamber. TVA work in these areas contributed to the development of models for assessment of air pollutant impacts, including acid rain. TVA has also conducted the only long-term visibility study for the Great Smoky Mountains National Park.

In the early years, large-capacity tree nurseries were not available in the Valley to help meet the goal of the TVA Act "to provide for the reforestation and proper use of marginal lands." Responding quickly to the need, TVA developed nurseries in eastern Tennessee and northern Alabama designed for high-volume production of top-quality seedlings at minimum cost. In the 1930s heavy emphasis was placed on "public works" hand labor, but methods were changed to emphasize state-of-the-art development in technology and mechanization. TVA also developed procedures for cost accounting, job allocation, and administration for efficient management of large-production nurseries. A number of publications were distributed on nursery methodology and research. When an operations guide on TVA nurseries was published, it was requested by 42 States and 16 foreign countries. Valley States used the information to develop and improve their own forest nurseries to supply State needs and the larger forest industries began their own nurseries. When TVA phased out its seedling production facilities in the early 1960s, the two nurseries had produced over 556 million seedlings, an important contribution to the 600 million planted in the Tennessee Valley through cooperative efforts between 1934 and 1960.

Reforestation for erosion control was the major initial effort toward rebuilding the forest resource of the Valley and preventing rapid sedimentation of TVA reservoirs. During the period from 1890 to 1932, only 3,870 acres of trees, or an average of 90 acres per year, was planted in the entire Tennessee Valley. To meet the need for reforesting over 300,000 acres of severely eroded lands, several significant actions were taken. Sites were mapped; erosion control structures were designed; reforestation plans were drawn up; cooperative programs of education and demonstration were initiated since most of the eroded land was in private ownership; and 38 Civilian Conservation Corps (CCC) camps were assigned to TVA to provide a large public work force. By 1942 when World War II closed down the CCC camps, 107,000 acres of eroded lands had been planted in the Tennessee Valley. Following this era, reforestation involved intensive cooperative

efforts with State agencies and landowners. TVA continued to supply technical help, promotional information, and tree seedlings while the States promoted interest and maintained direct contacts with landowners. During the 1943-1957 period, 220,000 acres were planted. Although interrupted and delayed by World War II, reforestation by 1957 had been applied to 327,000 acres of severely damaged sites in the Tennessee Valley, and these specific erosion problems were largely under control.

In 1933 less than half of the forest land in the Valley had any fire protection and, even where available, it was far from adequate. Total forest land burned averaged over a million acres annually. The chief TVA focus in fire protection was in prevention, with a strong emphasis on education of the general public and other government agencies and in working cooperatively with various forestry groups. In an intensive educational campaign TVA held over 7,400 community meetings for almost 897,000 people from 1938-1949 to show the ravages of forest fires, the benefits of an effective fire control system, and the need for prevention. Public support for State fire control grew and TVA assisted in development of the State control systems. Also, cooperative fire control projects were initiated in specific problem areas by TVA, and State, county, and local groups. Nine of these five-year projects were completed covering 50 counties in six States. On a Valley-wide basis the percentage of forests burned each year dropped from about 10 percent in 1933 to 4.7 percent in 1950 and to only 0.5 percent in 1960 when TVA began to phase out its fire protection program. By 1966 fire control was available to nearly all forest lands in the Valley and the annual percentage burn rate was between 0.25 and 0.5 percent. Fire protection is a job that is never totally complete, however; and TVA now has a regional advisory and supporting role to the seven State forestry organizations.

The establishment of the Forest Resources Systems Institute (FORS) in 1983 is an example of TVA's approach to taking the early risks, developing technology and demand for products, and then spinning off a private sector organization to carry out the technology transfer and support services. In the late 1970s and early 1980s TVA pioneered nationally the development of microcomputer software for forest management applications. This WOODPLAN family of software was highly successful, but TVA recognized that its small forestry research and development team could not provide technical support for all the new software users. This provided a spin-off opportunity, and the concept of a non-profit membership cooperative to serve as a center of technical support and information for microcomputer users in the forestry resources sector evolved. In October 1982 TVA convened a forestry committee which included consultants, industry, State agencies, extension services, forestry associations, universities, and the U.S. Forest Service to evaluate the feasibility of forming an institute composed of subscribing members. The potential value and impact of the proposed organization were quickly recognized and strongly supported, and a number of attendees volunteered to assist TVA in forming the institute. TVA supplied

technical support and initial funding, and FORS became operational in August 1983 with the hiring of a full-time program coordinator experienced in computer applications in forestry. Since August 1983 membership has grown to 221 individuals and organizations, exceeding the initial two-year target growth. Membership includes representatives from throughout the United States and from Canada, France, Malaysia, and Zimbabwe.

One of the keys to the success of the industrial siting program has been TVA's ability to identify areas and sites where opportunities for forest industries were maximized and risks were minimized. The vastness of the forest resource is only one aspect of what an industry needs to know about a prospective plant location before final selection is made. TVA's forest inventory system has been instrumental in providing timely information in significant detail (e.g., species, size, volume, quality, etc.). In addition, prospective plants need facts and figures regarding availability and costs of power, transportation systems, manpower, and water availability. The success of TVA in stimulating the economy through working with industries is indicated by a list of some of the successful sitings: Bowaters Southern Pulp and Paper; Columbia Plywood; Tennessee River Pulp and Paper; Mead Paperboard; Hassell-Hughes; and Savage Lumber Company.

With the establishment of Kentucky and Wheeler Reservoirs in the mid-1940s, TVA created a series of diked subimpoundments called dewatering areas, which were pumped dry during summer to eliminate habitat for malaria-transmitting mosquitos and protect rail and highway rights of way. Wildlife biologists began to manage these areas for waterfowl subsequent to their establishment. By 1962, 68 percent of all waterfowl wintering in Alabama and Tennessee were located in the Tennessee River Valley. Management of TVA dewatering areas has resulted in an increase from some 10,000 waterfowl wintering in the region in the early 1940s to one-half million in the 1980s.

From 1970 to 1980 TVA wildlife staff pioneered the development of reclamation technology necessary to restore productive fish and wildlife habitat to southern appalachian coal surface mines. This work culminated in a 1979 cooperative TVA/U.S. Fish and Wildlife Service project to develop and test a model fish and wildlife reclamation plan for the region. This reclamation approach was subsequently published and promoted by the U.S. Fish and Wildlife Service as an alternative postmining land use. Adoption of this technology by commercial operators has resulted in wildlife habitat restoration on thousands of acres of coal surface mined land in southern Appalachia.

TVA developed techniques and initiated an osprey restoration project in 1979, a bald eagle project in 1980, a golden eagle project in 1981, and a peregrine falcon project in 1984. With the cooperation of private, city, State, and other Federal agencies, these projects have released over 180 raptors. Thus far,

ospreys and bald eagles have returned to nest. Nearly a dozen States are now successfully using these techniques.

The TVA reservoir system has become a major focal point for outdoor recreation in the region. In 1983 TVA reservoirs received an estimated 69 million recreation visits, and associated benefits reached over \$200 million. There was early recognition that the construction of the reservoir system would create a new range of recreation opportunities in the region, and TVA's early recreation programs were designed to demonstrate and promote the potential of these and other resources in the Valley.

In its first few years, TVA undertook an inventory of "scenic resources," a new dimension in regional planning of that day and ultimately a classic publication in the recreation field. In cooperation with the National Park Service and the Civilian Conservation Corps, TVA also built some demonstration parks and a boat dock, and operated them to show the recreation development possibilities of new lakes. This temporary role as park developer and operator was necessary because only two of the seven Valley States had conservation or park agencies in 1933. Following two major studies of recreation potentials, TVA joined with the National Resources Committee in calling for meetings with the planning boards of the southeastern States to review these studies and to consider legislation, planning and promotion measures, zoning, hotel and restaurant standards, and, significantly, the role of citizen organizations. These meetings contributed to a flurry of legislative activity, beginning with the State of Tennessee in 1937. Soon all seven Valley States had established or strengthened their park systems and recreation programs. Further, the States passed legislation providing for county recreation boards and authorized them to receive and use tax funds.

After observing TVA demonstration parks for several years, State and local agencies began developing recreation areas on lakeshore lands made available to them by TVA as early as 1937. Today there are 118 State and local parks on TVA lakes and many others away from the lakes. Private investors also became aware of the potential for commercial recreation facilities. The demonstration boat dock on TVA's first lake (Norris) was followed within three years by 11 more docks constructed by private investors. As other lakes were impounded, investors were ready to construct and operate boating facilities as soon as TVA requirements were met.

The partnership approach--working with other State and local agencies, the private sector, and the general public--is still a major theme of more recent TVA recreation program initiatives. A TVA community recreation project, undertaken in the 1970s and discontinued in 1982, provided technical recreation planning assistance to about 500 communities. This resulted in over \$25 million in improved recreation facilities and services and also led to the establishment of organized recreation programs in several Valley communities. This program also served as a catalyst in the organization of State technical assistance programs

in Kentucky and Tennessee. Similar technical assistance is currently extended to commercial recreation operations on the TVA reservoir system to help private operators maximize the potential of their facilities and meet public recreation needs.

During an eight-year period from 1973 to 1981 TVA, through a cooperative contract with the Tennessee Department of Conservation and the South Cumberland Recreation Commission, provided about \$1 million for land acquisition within the 12,000-acre Savage Gulf State Natural Area near Tracy City, Tennessee. Additionally, recent cooperative agreements with the Tennessee Department of Conservation and the Tennessee Field Office of The Nature Conservancy, as well as the Birmingham (Alabama) Audubon Society, established a working platform for interagency/private sector cooperation in natural area identification and protection planning for areas off TVA land.

TVA's role in developing a cooperative educational network of university-based centers for environmental and energy education is a significant achievement. Using its resources as a catalyst, TVA has created a model network that is functioning to provide needed educational services to the Valley in league with major Valley educational institutions. The network and center models are being replicated elsewhere in the United States and are being considered for use abroad. This effort provides support to TVA economic development and resource management mandates while forging strong alliances and partnerships with State and corporate groups.

One of the more recent successes has been the establishment of Land Between The Lakes (LBL) as a national demonstration in recreation, resource management, and environmental education. In 1963 LBL was established to convert an isolated rural area, lying between two major reservoirs, which was economically depressed and having a poor to marginal natural resource base into a national asset. LBL, the second largest contiguous unit of Federal property east of the Mississippi River is now the focal point for a \$150 million tourist industry.

A 1981 study by Murray State University, Murray, Kentucky, showed that LBL now provides benefits to the local region of over \$44 million annually. The two million annual visits to LBL, from all of the 50 States and several foreign countries, support in whole or in part over 2,000 jobs in the region in addition to the LBL employees. Many of the practices and principles demonstrated at LBL have been copied by Federal, State, and local agencies and LBL serves as a working model for educational institutions and areas where natural resources are managed for people. The environmental education program at LBL provides training to over 2,000 teachers, administrators, and professionals from 14 States and learning experiences to over 13,000 students. LBL is making significant contributions to the Nation and to the local region, and yet we have only begun to feel its full potential.

From 1976 to 1980 TVA administered a cooperative multi-State/landowner program to reclaim abandoned coal surface mines causing significant environmental problems. The project involved 38 southern Appalachian counties in Alabama, Kentucky, Tennessee, and Virginia. In this four year effort over 17,400 acres were reclaimed, and about 10.25 million trees and 5.1 million wildlife shrubs were planted. The project also provided almost 630 thousand hours of productive employment for local unemployed and underemployed residents in traditionally depressed areas.

In 1980 TVA identified abandoned mica, feldspar, and clay mines in western North Carolina as the cause of one of the 10 most critical water quality problems in the Tennessee River watershed. Over the next four years, TVA, in cooperation with North Carolina and others, successfully reclaimed 590 acres causing offsite degradation. The project has already reduced soil erosion on these sites and demonstrated reclamation techniques applicable to the local mining industry.

A general consensus exists that sustained economic growth cannot take place in the absence of a skilled work force. Recent studies conducted by TVA indicate that the low level of educational and technical skills of the Valley populace is a major impediment to job creation. These studies indicate that the educational community at large in the Valley is not fully addressing the issue of providing appropriate skills training programs for domestic and emerging industries. Through TVA skills development partnership arrangements, a minimum of 11,000 individuals annually are being trained and placed in occupations ranging from basic manufacturing to advanced technologies. The average cost to TVA per trainee placed in private sector jobs has averaged \$364 with 11,000 Valley residents being placed annually at an average hourly wage of \$8, resulting in over \$121 million in wages being generated into the Valley economy. Based upon a minimum of 10 percent return in Federal taxes, these efforts generate over \$12 million return to the Federal government. This equals a \$4 return on every Federal dollar invested in the TVA skills development program. In addition, State and local revenues receive about \$2.5 million in taxes due to these efforts.

In the area of community resources, some of TVA's major successes and achievements include the solid waste management program which helped over half of the Valley region's 201 counties convert from open dumps to State-approved sanitary landfills; the rural fire protection demonstration, which helped establish a dozen county-wide rural fire protection systems that are still thriving and saving lives, property and insurance costs; the Duffield Industrial Park in which three impoverished counties cooperated to achieve industrial diversification in the coal fields of southwest Virginia; the Townlift program which has created jobs and upgraded the appearance and functioning of the downtown areas of over 200 communities across the Valley, and served as the model for a national program--the National Trust for Historic Preservation's "Main Street USA" Program; and the community health program which brought doctors to rural areas, provided health screening for thousands of rural residents, established clinics where no medical facilities existed and upgraded the services and viability of small rural hospitals.

55. Question: The President's private sector survey on cost control commissioned by Mr. J. Peter Grace, and released on September 15, 1983, issued a series of recommendations aimed at cutting costs and improving efficiency in all areas of the Tennessee Valley Authority (TVA). Which of the following report recommendations have been implemented by TVA? What steps have been taken to implement the recommendations? If certain recommendations have not been executed please explain why.

A. Engineering design and construction program.

1. Third-party professional assistance should be secured by the OEDC to review its organization and staffing.

Answer: A study of OEDC operations was undertaken by Theodore Barry & Associates in 1978, from which many efficiency improvements were accomplished. The effectiveness of the OEDC organizational structure and the adequacy of planning, scheduling, and cost control systems available to managers were two key areas the consultant evaluated. In follow-up reviews in February 1980 and April 1981, the consultant found OEDC's performance impressive in implementing virtually all of its recommendations. More recently, the consolidation of OEDC with the Office of Power in February 1984 has led to in-house, in-depth reviews of organizational structures, manpower requirements, and potential efficiency gains. By April 1984, a reorganization of the nuclear power program following the consolidation brought engineering, maintenance, and operations resources under a nuclear plant site director, providing more timely decisionmaking processes and communications systems. United Research Company assisted in designing and implementing that new organizational arrangement.

Question: 2. A study should be conducted to review the potential for reducing the engineering design staff by at least 200+ over the next five years.

Answer: The reorganization of OEDC with the Office of Power, the reduction in the number of nuclear plants under construction, and the voluntary reduction-in-force notice of April 1984 should bring significant reductions in the Engineering Design Staff over the next several years.

Specifically, current manpower projections indicate a reduced level to some 2,000 design personnel by 1989. Further refinement of organizational structures and manpower requirements may lead to further reductions.

Question: 3. An engineering economic program should be established by the OEDC.

Answer: Such a program is now in place.

Question: 4. A program should be implemented by the OEDC to monitor the operating performance of key components used in the TVA system.

Answer: Such a program is firmly established in the power components in Power and Engineering. A similar system is being developed for the Office of Construction and the Office of Engineering, with particular emphasis on monitoring the status of construction projects.

Question: 5. An independent study should be conducted to compare the craft man-hours expended at Watts Bar versus those expended at similar nuclear projects separate of TVA.

Answer: The comparison of one nuclear construction project to another is extremely complex due to the differences in plant design and construction methods, as well as the timeframe in which the plant was designed and built. At this stage of our construction, we question the desirability of expending significant resources to make a detailed independent study comparing Watts Bar and Byron, as suggested by the PPSSCC. The President's Private Sector surveyors identified several differences but reported they could not account for some 20 million man-hours of difference. Our experience to date suggests that these differences may be accounted for largely in the difference in basic design and the extent of onsite fabrication. For example, Watts Bar has a fifth diesel generator, low-level radwaste storage, volume reduction, additional seismic requirements, etc. Onsite work includes the mixing and transporting of concrete which is typically a material cost but with TVA is included in the craft man-hours. In addition, TVA man-hours include TVA switchyard, transformer yard, and other features which utilities often exclude. Since we are committed on the design and construction, and construction is nearing completion, it is our judgment that TVA resources could be better applied in seeking ways to improve our present operations rather than attempting to track elusive numbers. This judgment seems to have been supported by the most recent estimates available for the Byron and Watts Bar plants. Commonwealth Edison's August 1983 cost per kilowatt estimate shows that the Byron plant has increased from \$1229 per kilowatt to \$1868 since the study group wrote its report while TVA's cost per kilowatt at Watts Bar has increased from \$1350 to \$1650. This report suggests that TVA's Watts Bar Plant now has a construction cost advantage as compared with Byron.

We have completed a major reassessment of TVA's Bellefonte Nuclear Plant--TVA's only other active nuclear construction project--identifying problem areas and initiating corrective measures to improve productivity in completing the design and construction

of that plant. Since TVA's nuclear construction program is phasing down, a study of the magnitude recommended would not seem to be cost effective.

Question: 6. TVA should identify ways to counteract the disincentives for cost control inherent in its financing and rate setting practices.

Answer: Unlike privately owned electric utilities, TVA has no disincentives for cost control. TVA is required by statute to keep its electric rates "as low as are feasible," while still maintaining a financially sound electric system. Moreover, rates are adjusted only after reviewing with TVA's wholesale customers pertinent data on the current and anticipated conditions and costs affecting TVA's operations and the adequacy of its revenues to meet the requirements of the TVA Act and the tests and provisions of TVA bond resolutions. Of course, rates also receive considerable scrutiny--formal and informal--by Members of Congress and congressional committees. In contrast, the primary objective of a privately owned electric utility is to get the largest profit for its stockholders.

In carrying out its responsibility to keep rates as low as feasible, TVA has been fortunate to be able to finance its power system at interest rates that are not quite as high as the electric utility industry norm (TVA bonds sold on the public market were accorded a triple-A rating), but these interest rates have not been particularly "low." In any event, TVA's lower cost financing has certainly not encouraged the construction of unnecessary facilities, as the report's recommendation implies. Power system facilities are planned and begun solely on the basis of projected needs--that is, forecasts of future demands for electricity. The high load forecasts that were made nationwide in the 1960s and early 1970s caused TVA and most other electric power generators to commit to a large increase in generating capacity. TVA's statutory responsibility "to assure an ample supply of electric power" formed the basis for it doing so. As a result of significantly changed conditions, load forecasts in the late 1970s and early 1980s became considerably lower. In light of such revised forecasts, TVA recognized that all of the plants being constructed would not be needed as scheduled, and as a consequence, construction was halted on eight large generating units. In both cases, load forecasts, not the anticipated cost of financing, were responsible for the decision.

Question: B. Personnel and labor relations.

1. A staff reduction of 340 employees should be implemented by TVA. Specific areas which should be targeted are: response and communications staff, research and analysis branch, labor relations, and division of personnel.

- Answer:
- o Personnel Staffing and TVA Employment. Since 1982 TVA's personnel staffing, including field personnel, has decreased by 28.9 percent and TVA's total employment has decreased by 13.5 percent. Further personnel staff reductions will be made as appropriate, continuing to reflect changes in the TVA work force.
 - o Division of Personnel. Since 1982 staffing in the Division of Personnel has decreased by 26.9 percent. Additional adjustments will be made as appropriate to reflect changes in the TVA work force.
 - o Response and Communications. Since 1982 the staff has been transferred to the Employment Branch within the Division of Personnel and reduced to one full-time employee with part-time clerical assistance provided by branch personnel. The transfer of this function to the Information Office staff continues not to be a feasible option because of the specialty work of investigating complaints relating primarily to personnel management.
 - o Research and Analysis Branch. Since 1982 the branch has reduced its staffing levels from 14 to 11 full-time employees, which represents a 21-percent reduction. The work of the organization continues to be the evaluation of existing research literature and personnel program evaluation as opposed to conducting original research. Further reductions are not feasible at this time as the need for personnel program evaluation is a necessity.
 - o Labor Relations Staff (Management Services Office). Since 1982 the Labor Relations Staff has been reduced from 32 to 21 employees, a 34.38-percent reduction in personnel. Of the four assistant and assistant-to positions, three were abolished in our last reduction effort. Future staffing of this organization will continue to mirror the agency's employment levels which control the staff's involvement in union contract administration and in support of line and operating organizations.

Question: 2. Through negotiations, TVA should remove from the bargaining unit: 1) all positions with the authority to hire, fire, discipline or recommend these actions and 2) all employees who work in confidential areas of TVA.

Answer: (1) TVA has the authority to remove from the bargaining units any currently represented employees who are properly viewed as management employees because they have supervisory responsibilities, including responsibility in hiring, firing, or disciplining employees. In the past, where TVA has recognized some benefit in doing so, positions have been removed from the bargaining unit. The attempt to remove annual maintenance foremen to the management schedule was referred

to an arbitrator for determination, and TVA's attempt was rejected by the arbitrator. In 1984 TVA was successful in negotiating a provision into its collective bargaining agreement covering white collar employees specifically recognizing its right to designate positions as management and thus remove them from the bargaining unit.

- (2) TVA was successful in the 1984 negotiations in getting represented employees assigned to confidential positions removed from the bargaining agreement. A total of 88 employees were moved to the excluded schedule.

Question: 3. TVA should remove contract clause which requires TVA to give preferential treatment to union employees with regard to promotion, transfer, shift preference, etc.

Answer: TVA's labor agreements have been revised to delete the union preference provision with respect to personnel involving TVA employees. The only remaining union preference is in appointments of outside candidates to trades and labor positions.

Question: 4. Re-evaluate those cases where a secretary/clerk typist supports only one manager/supervisor. Instead, a ratio of 3 (supervisors) to 1 (secretary) should be implemented in those cases where no word processing is used. A ratio of 5 to 1 should be the objective when word processing is available.

Answer: TVA has taken steps to streamline clerical operations by:

- o establishing central word processing and typing pools in several organizations
- o establishing clerical teams rather than continuing individual manager/ secretary arrangements in other organizations
- o moving ahead on the utilization of improved word processing technology
- o analyzing the nature of secretarial work to seek improvements
- o conducting the type of evaluations the PPSSCC suggests

We are making effective progress in this area and will continue to do so.

Question: 5. Re-evaluate the current TVA organization and staffing levels for possible staff and cost reductions.

Answer: TVA for many years has been evaluating the need for positions based on existing guidelines. Positions are not created until the need occurs.

TVA has made major changes in its structure which have streamlined the organization significantly. In October 1983 two offices were merged into one with the creation of the Office of Natural Resources and Economic Development. In 1984 the Power and Engineering organization was formed combining the engineering, construction, and power system functions under one manager. Also at that time, two divisions were eliminated. All of these changes have resulted in a savings in administrative costs and an increase in the span of control of several managers.

TVA continues to evaluate its organization for additional opportunities for streamlining and cost reductions. However, TVA considers many factors in establishing an organization structure. While span of control is one factor, we do not believe it would be responsible management to rely solely on the span of control formulas recommended by the Grace Commission.

In regard to assistant positions, TVA for many years has been evaluating the need for such positions based on specific guidelines. A copy of these guidelines is attached (Appendix A).

Question: C. Compensation and benefits.

1. TVA pension benefits should be revised to reflect a more equitable and reasonable retirement plan than currently exists.

Answer: We disagree that a study of the recommended items, which are already properly handled by the Retirement System, would be of any benefit. Pension benefits are reduced for those who retire early and in view of the limitations on total benefits available to employees, the integration of social security with TVA's retirement benefits is appropriate now.

The TVA Retirement System was established in 1939 and, under its rules and regulations, the System is managed by the Retirement System Board of Directors, which is responsible for initiating any changes in the System's benefits. It is a tax-qualified pension plan in which some members have certain nonforfeitable (vested) interests. No changes can be made that would reduce vested benefits, and it is not desirable to change the System's tax-qualified status.

TVA's early (prior to age 65) retirement benefits are less than benefits received on retirement at a higher age. A person who retires at age 55 with 25 years of service receives a pension that is less than two-thirds the amount the pension would be for that person at age 62. For a person with less service, the

amount of the early retirement reduction is even greater. The benefits also depend in part on any employee's own contributions which may be as little as 3 percent up to the social security wage base and as much as 16 percent of salary.

The already reduced benefits of a retirement before age 65, the mandatory employee contributions which pay for part of the retirement benefits, and the noncompetitive salary all are persuasive arguments against any further reduction of early retirement benefits. Moreover, reducing current benefit levels would exacerbate an already difficult employee retention problem caused by noncompetitive salaries. Any change in Retirement System rules and regulations must be initiated by the TVA Retirement System Board. The cost-of-living feature does not, as the survey concludes, "protect the pension for the life of the retiree." It is limited to 5 percent in any one year unless the Retirement System Board approves a larger amount. The TVA Board may disapprove the larger amount. Since the cost-of-living provision was added in 1968, the cumulative cost-of-living increases have amounted to 130 percent. This increase only applies to the pension and not to the annuity. On the other hand, for the same period, cumulative civil service retirement cost-of-living increases have amounted to 237 percent (i.e., a \$100 per month benefit in the TVA Retirement System would have increased to \$230, while a \$100 civil service retirement benefit would have increased to \$337). Many private companies periodically increase retirement benefits to take account of inflation.

Question: 2. TVA should revamp its relocation policy which currently does not provide ample incentives for job transfers within TVA by employees.

Answer: This recommendation recognizes the efficiencies and long-term benefits that can result from the judicious expenditure of additional funds. The amount of TVA's reimbursement of moving expenses of its transferred employees is generally limited and controlled by statute and GSA regulation. TVA has exercised the flexibility that it possesses to provide monetary incentives for its managers to relocate if the move is in TVA's interests. However, legislation is needed to resolve the basic problem of the monetary losses that some employees incur if asked to relocate. These are primarily interest-related costs that are not reimbursable, but are material when an employee purchases a new home. This is particularly true where the employee is moving to an area with a higher cost of living, and is giving up a low-interest loan and acquiring a new mortgage at a substantially higher rate. These mortgage differential costs and moves to areas having higher costs of living are of consequence when employees, particularly senior managers, are asked to relocate.

Public Law No. 98-151 made a number of significant substantive changes to the Federal laws governing reimbursement for travel,

transportation, and relocation expenses of transferred Federal employees. These changes, which increased several allowances and authorized two new allowances--contract relocation services and income tax liability reimbursement--have removed a significant financial burden from TVA's transferring employees. In contract relocation services, TVA was in the forefront in contracting with a private relocation firm to provide for the purchase and later sale of a transferred employee's home. This allows our transferred employees to move to their new job locations with the equity in hand without the burden of dual house payments and lingering obligations at the old official station. Additionally, as authorized by the new law, TVA has revised its travel regulations to more equitably reimburse its transferred employees by

- (a) increasing the limit which restricts the allowable reimbursement for shipments of household goods to 18,000 pounds;
- (b) extending the period in which subsistence expenses may be paid while an employee is occupying temporary quarters to 60 days, and with certain extenuating circumstances, to 120 days;
- (c) increasing the maximum allowable amount of reimbursement in connection with certain real estate expenses and providing for annual adjustments to these reimbursements to reflect increases in the CPI;
- (d) authorizing reimbursement to compensate the relocated employee for any additional Federal, State, or local tax liabilities incurred on account of the Government's initial reimbursement of relocation costs.

While these new reimbursements and allowances have greatly reduced the financial burden placed on transferring employees, there are still areas where transfers cause material financial burdens to the employee. TVA would welcome legislation permitting more equitable reimbursement and incentives for transferred employees. Within these statutory and regulatory constraints, TVA has consistently moved toward as complete a compensation program as it has the authority to do.

Question: 3. TVA should increase medical insurance premiums to 50 percent for all represented employees.

Answer: TVA and the representatives of its white-collar employees bargain collectively over TVA's contribution to medical plan premiums as well as salaries and other matters, based on the prevailing rate for similar positions in the relevant labor market. Salaries, medical benefits, and other monetary fringe items are included in the overall determination of the prevailing rate. Therefore, reduced TVA medical insurance contributions could result in higher wages and other payroll tax costs.

But equally important, the more effective way of dealing with health costs in American industry is to negotiate changes such as a second opinion, handling routine surgery as outpatient treatment, preadmission testing, and use of generic drugs as means of improving utilization of the existing health care plans. Some time ago a joint labor-management committee began work on such changes in the TVA plan which have since been implemented, effective October 1, 1983, to help control increases in plan costs for TVA as well as employees. The agreed-upon changes make employees more careful consumers of medical services, thereby achieving real savings in medical insurance costs rather than merely redistributing ever-escalating premium costs. Since implementing these changes, there has been no escalation of medical insurance cost to TVA or the employees. Because of the success of the cost containment effort, the contract provision which makes employees responsible for any actual cost experience different than projected was put into effect. The employee contribution for the last several months of fiscal year 1985 was waived because of a large accumulated surplus over required reserves.

Question: 4. TVA should approach Congress in an effort to pass legislation that would permit TVA to increase management salaries that would be more competitive with those in similar utility operations in the private sector.

Answer: We are gratified to have a group of private business persons recognize the seriousness of TVA's executive turnover and salary compression problems and recommend needed changes. It is frequently difficult to obtain recognition that spending a relatively small amount of money may be the best way to save or produce much larger amounts. This is the case for paying reasonable competitive salaries to TVA executives so that we can attract and retain the most-qualified persons to help TVA operate efficiently, economically, and safely. We support this recommendation.

Question: 5. Business trip per diem rates should be increased by TVA to better reflect current market rates.

Answer: Like the relocation expenses mentioned above, per diem rates are generally regulated by statute and GSA regulations, and TVA pays per diem in accordance with those requirements. When it has the authority to do so, TVA makes adjustments in these rates to more accurately reflect what TVA has found to be the cost of traveling in particular areas. However, with the maximum payments established by statute and regulation, it is frequently impossible to fully reimburse employees for reasonably incurred travel expenses. We therefore agree that some changes in travel reimbursements would be beneficial and suggest that the statute and

GSA regulations be amended to allow agencies increased flexibility in maximum payments. Like relocation payments, this matter is largely outside of TVA's control.

Question: D. Generating plant efficiency (coal-fire and nuclear).

1. TVA should fill the position of assistant director for maintenance and engineering within the Office of Fossil and Hydro Power in order to provide better communication and increase efficiency among coordination responsibilities.

Answer: This has been done.

Question: 2. TVA should increase supervision by senior management in the fossil-fueled plants.

Answer: Fossil plants are visited on a regular basis by senior management. In addition, superintendents at these plants meet regularly with their supervisors in Chattanooga. Recommendation for senior fossil and hydro managers to visit the plants on a weekly and biweekly basis is not practical on a system of TVA's size. Superintendents are expected to manage plants with a large degree of independence.

Question: 3. TVA should renegotiate all labor contracts to ensure optimum use of personnel.

Answer: TVA has continued its efforts to negotiate greater management flexibility in the utilization of its work force for improved manpower efficiencies. In the trades and labor area, greater efficiencies have been realized in implementing a "mixed crew" concept for performing craft maintenance work (eliminating work jurisdictional inefficiencies) and in implementing a "call by name" employment process instead of relying heavily on union hall referrals. In the salary policy area, contract language was negotiated to clarify management's right to contract out work where it proves more efficient. We are continuing to work toward greater improvements in this important area.

Question: 4. Plant support systems should be implemented immediately at all TVA plants if the pilot program proves to be successful.

Answer: TVA is moving toward implementation of a plant support system for improved maintenance planning and execution as recommended. This

effort was well underway prior to the time of the FPSSCC inquiry. In addition, TVA is adding maintenance standards to its work planning process.

Question: 5. TVA should re-align its plant organization so that it has the capability to conduct engineering support activities.

Answer: The observations that more input is needed by plant personnel into the preliminary engineering design phase of new plants and plant equipment are valid. In our Division of Nuclear Power we are currently considering changes in our design modification review and decisionmaking process, which will permit increased levels of interaction between both the plant and central office technical personnel and the design organizations.

Question: 6. All control of scheduling and budgeting for construction personnel working on capital projects should be shifted from the operating plants to the plant manager.

Answer: In 1984 TVA combined the power, engineering, design, and construction organizations. Under the new organization structure, budget control over retrofit and capital improvement projects is placed with the plant manager.

Question: 7. An in-depth study should be conducted on the economic impact of NRC regulations before they are implemented.

Answer: The mechanics to carry out the reviews recommended are in place.

Question: 8. Duplicating efforts between two internal groups which audit the Division of Nuclear Power should be eliminated.

Answer: Both the Nuclear Safety Review Staff and the Office of Quality Assurance are aware of the possibility of duplicating effort and have taken steps to avoid such overlapping activities. In any event, we view the quality and safety assurance functions that the two organizations perform to be of such importance in our nuclear program we would not make this decision solely on a short-term economic basis.

Question: 9. Coal procurement

1. TVA should establish an office of Fuel Supply which would consist in part of employees from the Division of Fuels and the Division of Purchasing, as well as

individuals responsible for surveillance and operations of coal mines, and the fuel contract administration.

Answer: TVA reorganized its power, engineering, design, and construction activities in June 1984. At that time, significant changes were made in fuels planning in an effort to mesh that aspect of TVA's operations with the new owner-operator concept that is now in effect. Under the new arrangement, managers responsible for nuclear operations are charged with nuclear fuels planning, while those involved in the operation of TVA's fossil plants have the duty of planning coal purchases. The new fuels planning system is already producing significant positive results.

Question: 2. A long-term strategic plan by the Board of Directors and General Manager should be instituted along with an annual review and approval of the Coal Procurement Plan.

Answer: Power and Engineering currently provides the Board and General Manager with an annual coal supply plan, along with quarterly updates. It also conducts an annual assessment of TVA's need for and utilization of coal reserves.

Question: 3. Current bidding procedures and award processes should be made more flexible for future contracts.

Answer: All TVA purchases must be accomplished under the requirements of the TVA Act and other applicable laws and regulations. TVA has in place procedures more progressive than previously for the approval of competitive negotiations in conjunction with major contract reopeners. Further, legal and purchasing staffs have developed a two-step purchasing procedure, consistent with TVA's procurement requirements, which provides for technical evaluation of offers and consideration of terms and conditions in the first step and request and receipt of offers in the second step. This procedure is being implemented on a major coal purchase.

Question: 4. TVA should restrict further acquisition of coal reserves.

Answer: TVA has initiated a limited leasing program of TVA coal reserves that cannot be utilized by TVA in the foreseeable future. For some time TVA has only purchased blocks or windows of reserves adjacent to existing TVA reserves in an effort to consolidate minable acreage.

Question: 5. TVA should create policy directed toward ceasing operations of any new coal mines.

Answer: No new mines have been planned for several years.

Question: F. National Fertilizer Development Center Program (NFDC)

1. TVA should consider alternative approaches to funding the NFDC program. Initially, these approaches would support only a portion of the NFDC program. However, in the future these approaches would be extended to support the entire NFDC program.

Answer: TVA's fertilizer research and development is heavily supported by user fees in that sale of experimental fertilizers through the introduction program traditionally has covered about half of the total capital and operating expenses. (That share will be somewhat smaller in fiscal year 1985 because fewer tons were sold and prices were depressed.) Very few Federal programs can match this record of financing with their own funds. Indeed, we believe this may be the most cost-effective technology transfer program in the Federal Government.

Moreover, it is our perception that the Congress has viewed the fertilizer research program as one benefitting the entire Nation, not just commercial users of TVA-developed technology or even farmers. As improved fertilizer products and processes improve the efficiency of agricultural production, all consumers benefit from lower food costs in the marketplace. For this reason, a portion of the costs of the introduction program have been met with appropriated funds.

We are also looking at alternative funding approaches, as suggested by the Grace Commission. The most practical alternative is an excise tax on fertilizers. Such a tax could be imposed nationally, perhaps with collection at the point of sale through State agencies which already monitor and collect certain information related to fertilizer use. The Administration has opposed initiating legislation to establish such an excise tax.

We are exploring other possibilities for enlisting private financial support for our programs. We may be able to generate income through such avenues as charging for technical services provided to commercial firms, publications, licenses, etc. Also, there may be situations where we will find it mutually advantageous to enter into joint venture agreements with one or more private firms with each sharing in project costs. Finally, we are exploring opportunities for contracting for the use of some of our facilities in ways that will benefit others as well as our own programs. The most promising area in this regard is with our ammonia-from-coal project, for which appropriations support is being phased out this year. We are modifying this developmental program to a nonfertilizer use and working with the Electric Power Research Institute and the Department of Energy to develop, hopefully, \$10 million per year of contractual funding over the next four years.

Some of these ideas may be worth trying; others may offer too little to warrant the effort or risk. Few approaches, other than the excise tax, offer the certainty of funding that is needed for the effective management of a large-scale R&D program. Also, some kinds of charges would likely be counterproductive to effective technology transfer.

In total, it is difficult to envision private funding replacing Federal funding on a large scale, but private sources might make limited contributions in some areas.

Question: 2. A long-term plan aimed at staff reduction should be implemented by TVA.

Answer: Major staff reductions have been made at the National Fertilizer Development Center over the years. Employment in the mid-1960s was in the 1500-1600 range. Today, it is about 965. And we are planning to release about 30 additional employees in June.

The biggest change in employment came with shutdown of our electric phosphorus furnaces about 10 years ago. We now purchase from commercial sources the phosphoric acid needed for our developmental programs. Additionally, about 60 persons in our two research divisions were discharged as a result of budgetary constraints about four years ago. This was a reduction of about 10 percent of our professional and technical staff, with a loss of hundreds of years of valuable experience.

We cannot undergo further significant staff reductions without adversely impacting major program areas. We are developing day-to-day working relationships with a newly formed Alabama University Research Consortium. We do not see this as replacing existing staffing, but as strengthening our total capability by tapping additional expertise at the research universities. Conversely, we believe the universities and the people of the area will benefit.

Question: 3. TVA should re-examine government support of the biomass research which is currently being conducted by NFDC.

Answer: We do not agree with the Commission that biomass research--to develop practical ways to get energy from trees, farm crops and wastes--is beyond TVA's charter. TVA is a regional development agency. Developing fuels from biomass has tremendous implications for the region as well as for the Nation. This research area has potential for creating jobs, generating new income, displacing some of our petroleum imports, reducing the deficit in international payments, and contributing to national security.

We believe that "Government support of the research" has been established. The Congress has provided funds for us to conduct

research in this area. Subcommittees of the Congress have invited TVA testimony on biomass and made suggestions regarding our role. The Congress has designated a role for biomass in the Department of Energy, which in turn turned to TVA for technical support on several biomass fronts. We manage for DOE the Southeastern Biomass Energy Program, which includes 13 States and which is proving to be very effective in generating interactions among universities, Government, and private interests.

Question: G. Financial reporting system

1. A substantial long-term effort to upgrade and improve the current financial reporting process should be undertaken by TVA.

Answer: The President's Private Sector Survey on Cost Control correctly identified the problems with the present TVA accounting code structure. However, we disagreed with the implication that all aspects of the financial reporting system were ineffective or inefficient. The external financial reporting, as evidenced by the unbroken record of unqualified opinions by the independent auditors, was and still is very effective.

Since the time of the survey, TVA has continued a two-step approach to improving the financial reporting process, and has acquired general ledger and financial reporting software to replace several different inhouse systems. The software is now being implemented, and the completion of this first step, full implementation, is expected by February 1986.

The second step will be to revise the account classification structure to enhance internal financial reporting. A revised account structure has been developed and will be implemented in conjunction with the general ledger and financial reporting software. Full implementation of the new account structure is expected by October 1986.

Question: 2. TVA should implement an in-depth study to evaluate its automated data processing system.

Answer: Considering the in-depth reviews conducted by the General Accounting Office in 1979, 1981, and 1982, plus the improvements made by TVA and acknowledged by GAO, we do not believe that another study of the TVA centralized ADP functions would be beneficial at this time. Outside consultants are currently assisting in a review of TVA's central computing operation.

APPENDIX A
(Part B.5)

Assistant/Assistant To Positions

Assistant Positions are established only after a careful examination shows no adverse impact on the organization's delegation of authority. Except at the division level, the incumbent's sphere of authority is generally the same as that of the principal. Directives can be issued independently and subordinate managers report to the principal through the assistant. Assistant positions are usually allocated one grade below the principal. When the principal is absent the incumbent assumes the role of head of the organization. Such positions are warranted only when one or more of the following criteria are met:

- o The scope and volume of the principal's work is such that additional assistance is clearly required to effectively manage the organization.
- o The position is needed to develop a replacement for the principal where such duration of employment is of short term.
- o Circumstances require the absence of the principal for unusually extended periods of time.

Assistant To Positions relieve the principal of specific administrative or technical matters which require higher level management attention. Incumbents perform specialized assignments or direct or coordinate activities in one or more administrative or technical areas. Typical duties include:

- o Providing specialized assistance and advice to the principal in one or more technical or administrative areas directly related to the branch or division organizational mission.
- o Coordinating the work activities among the sections/groups within the branch when a significant portion of the branch's workload cuts across section/group jurisdictional boundaries.
- o Performing a variety of specialized assignments of a complex nature involving the planning, scheduling, and coordination of the branch's work.

Assistant to positions are not usually established below M-5. Typical M-5 assistant to's are found in service division branches (e.g., Purchasing, Comptroller, Management Systems, etc.). Many of these jobs currently carry other titles but are essentially assistant to in nature.

M-6 assistant to positions are found in very large branches with heavy technical workloads. Incumbents may be assigned responsibility for a number of administrative or technical functions and perform highly specialized program planning, scheduling, and evaluation activities for the principal.

56. Question: The Grace Commission Report contained a number of recommendations concerning the TVA and its borrowing practices with the Federal Finance Bank (FFB). One recommendation indicated that TVA's overall debt cost could be lessened by taking advantage of Eurodollar borrowing, original issue discount debentures (OIDs) and other alternatives to FFB financing. What action has TVA taken to implement this recommendation? If none, why?

Answer: Eurodollar borrowings have not appeared suitable for TVA's present needs. Eurobonds are available for only intermediate maturities, usually five-ten years, and TVA has very limited demand for maturities in this range. TVA's assets are generally long-lived--30 years or more--and financial prudence requires that debt maturities be closely aligned with asset lives. Since these market opportunities occur only occasionally and would be suitable for only a very small portion of TVA's needs, the current FFB financing arrangements are preferable.

In December 1984 an original issue discount debenture (OID) was marketed by a limited partnership which owns and leases back to TVA a large office complex that will be used by TVA's Power and Engineering Program. The proceeds of the issue (\$132 million) reimbursed TVA for its expenditures to date in construction of the building. The bonds, which receive their credit backing from TVA's promise to make lease payments, received a AAA rating and commanded interest rates which we believe would approximate rates TVA would have received had it issued an OID bond directly. The interest cost for the 25-year portion of the serial OID bond issued by the limited partnership was 0.25 percent above that for U.S. Treasury 25-year bonds. Other maturities required even higher rates above U.S. Treasury securities of comparable maturities. Therefore, we do not believe that an interest cost advantage currently exists for OID's compared to FFB financing. One other undesirable aspect of OID financing for TVA's regular borrowings is that such bonds require the issuer to pay the original rate not only on the principal amount but also on the bonds' earnings throughout the life of the bonds.

57. Question: The Grace Commission has also recommended that TVA finance future short-term debt issues in the discount note market rather than through the FFB. The Commission believes that this would result in potential savings to the TVA in the form of reduced rates on some borrowings. Does TVA plan to utilize the discount note market? If not, why?

Answer: At the present time TVA has no plans to again utilize a short-term discount note program.

From July 1963 to September 1974 TVA obtained most of its short-term borrowing requirements through a publicly offered short-term discount note program. These notes were marketed in a manner similar to U.S. Treasury Bills with the New York Federal Reserve Bank acting as fiscal agent. The interest cost on notes issued during this period averaged 0.46 percent above comparable Treasury bills. The 0.125 percent above Treasury rates which TVA pays the Federal Financing Bank continues to be attractive compared to TVA's experience in the public market.

58. Question: Explain the TVA's loan arrangement with the Seven States Energy Corporation.

Answer: Since October 1979 most of TVA's nuclear fuel development has been covered under a leasing arrangement with Seven States Energy Corporation. The Seven States Energy Corporation is a wholly owned subsidiary of the Security Pacific Financial Services. Under its contract with TVA, it purchases from TVA nuclear fuel which TVA will need in the future to run its several large nuclear power plants. Seven States then "leases" that fuel back to TVA, with TVA making lease payments thereon when and as the fuel is actually needed in a power plant.

The process of mining, milling, and enriching uranium and fabricating nuclear fuel is a lengthy one that takes several years. Ordinarily, electric power consumers would have to pay these costs in their present electric bills even though they might not get the benefit of the electricity created by that fuel until several years later. By Seven States' owning the fuel throughout the development stages and leasing it to TVA, TVA can keep its present electricity rates lower by postponing coverage of the interest costs on the investment until the fuel is actually used to power a reactor. In short, this means that only the electricity consumers who will actually benefit from the use of the fuel will pay for it. It is consistent with the common electric ratemaking principle of charging consumers for costs at the time the consumers benefit from the incurred costs.

This kind of arrangement is common among electric utilities which have nuclear power plants. Seven States charges TVA a fee for its services in connection with this arrangement.

At the Federal Financing Bank's request, Seven States has borrowed the money it needs from the FFB, securing its loan with TVA's lease obligations under the nuclear fuel lease. The FFB treats TVA's lease obligations as a loan guarantee for the purpose of its making loans to Seven States under the FFB Act. Even though these transactions are presented in the Government's budget material as part of the Federal "credit budget," they do not have the same budget implications as other Federal credit activities. Like TVA's direct borrowings from the FFB, Seven States' borrowings are ultimately secured only by revenues TVA receives from the consumers of electric power. TVA's arrangement with Seven States does not result in any taxpayers' dollars going to pay the costs of either Seven States or TVA. Thus, no tax funds are involved either directly or indirectly in the form of a guarantee.

59. Question: Is it possible for the TVA to make a direct loan to the Seven States Energy Corporation rather than have the FFB provide the loan on TVA's behalf? If not, why? If it is permissible, explain why TVA has not done so.

Answer: Although it would be possible for TVA to make a direct loan to Seven States Energy Corporation for the latter to purchase TVA nuclear fuel, such an arrangement would not make sense and would provide no benefit to the power system.

Prior to the beginning of the Seven States arrangement, TVA financed all of its nuclear fuel acquisitions with its own borrowings. The TVA Act requires TVA electric rates each year to cover all interest expenses being incurred on TVA borrowings. Consequently, the carrying charges on a TVA-owned nuclear fuel inventory (i.e., interest expense from the time the fuel is purchased to the time it is consumed) cannot be postponed to the time of consumption.

The advantage of a third-party arrangement, like the Seven States arrangement, is that the ownership of the nuclear fuel by the third party enables these carrying charges to be capitalized as they occur and amortized later at the time the fuel is consumed. This means that such carrying charges do not have to be covered in TVA's current electric rates, but instead these costs will be covered through rental payments that are made at the time the fuel is being used to produce electricity.

The advantage of this arrangement would be lost if TVA borrowed funds, loaned them to Seven States, and leased back the uranium. If Seven States could not borrow funds from a third party at reasonable rates, TVA would be required to again borrow the funds necessary to purchase the nuclear fuel.

60. Question: It is anticipated that a significant portion of the TVA's total outstanding debt incurred between the years 1959 to 1973 will soon come due (assuming 30 year notes). Does the TVA intend to begin repayment on schedule or roll this debt over?

Answer: Currently, revenues resulting from depreciation are averaging approximately \$284 million annually and are expected to increase substantially as additional nuclear plants come on line. TVA's bond covenants require that power proceeds in the amount of such depreciation be used for investment in plant or to reduce capital obligations. Should additional growth in the future require these depreciation amounts to be invested in additional power facilities, outstanding debt would be rolled over. If depreciation amounts exceed the new capital needs, debt will be retired as it comes due.

61. Question: The claim has often been made that TVA's power rates are in effect subsidized due to Federal investment in the power system prior to 1959, low interest rates from the Federal Financing Bank, and other factors. Please address this issue in some detail and include in your answer constant dollar figures showing past Federal investments in the power system and how these are presently being paid back to the Federal Treasury.

Answer: An evaluation of TVA's legal obligations to make annual payments to the U.S. Treasury and the nature of its bond sales to the Federal Financing Bank indicates quite clearly that TVA power rates are not being subsidized by the Nation's taxpayers.

1. Federal Investment in the TVA Power Program

When the TVA power program was placed by Congress on a self-financing basis in 1959 it required, under Section 15d(f) of the Tennessee Valley Authority Act of 1933, that TVA power rates produce gross revenues sufficient to fund the power system's operating, maintenance, and administrative costs, as well as the costs of other specified legal obligations. Among these other costs are the two types of payments which are required to be made annually from power system revenues to the U.S. Treasury under Section 15d(e) of the TVA Act.

a. Repayment of Investment

First, annual payments are made to the U.S. Treasury as repayments of the appropriations invested by the United States Government in the TVA power system. These annual repayment sums (which were to be not less than \$10 million for each of the first five fiscal years and \$15 million for each of the next five fiscal years) are required under Section 15d(e) to be not less than \$20 million for each fiscal year "until a total of \$1 billion of said appropriation investment shall have been repaid." At the time the TVA power program began making these annual repayments in fiscal year 1961 the total appropriation investment was \$1,201,287,000. Congress set the \$1 billion ceiling on TVA's obligation to make repayments because, as stated in the Senate Public Works Committee report on the self-financing legislation, it was believed to be "advisable to retain some appropriation equity in the assets of the Corporation." As of the end of fiscal year 1984 TVA has repaid \$410 million to the U.S. Treasury, all such payments having been made on schedule.

b. Return on the Outstanding Appropriation Investment

In addition to the repayment sum, TVA is also required (under Section 15d(e)) to make, from power system revenues, annual payments to the U.S. Treasury as "a return on the appropriation investment in the Corporation's

power facilities." Unlike the fixed percentages used for the payment of interest on investment in other Federal projects, however, the return payment made by TVA each year is calculated by applying to the outstanding appropriation investment a percentage rate determined by the Treasury Department to "be equal to the computed average interest rate payable by the Treasury upon its total marketable public obligations as of the beginning of said fiscal years." Consequently, such return payments are based each year upon the Treasury Department's actual average current cost of money. Since the bulk of appropriations for the TVA power program were received over thirty years ago, when interest rates were much lower than they are currently, TVA's return payments result in compensation to the U.S. Treasury far in excess of its initial cost of providing these appropriations.

Such return payments will continue to be received by the U.S. Treasury as long as any portion of the appropriation investment remains unpaid.

c. Return Payments - Equitable or Subsidized?

One way of examining the question of whether TVA ratepayers are being subsidized by the Nation's taxpayers is to compare the amount of return payments made by TVA with the debt service that would have been required if TVA had been able to issue bonds to "buy out" the appropriation investment in the power program in 1959 (as an investor-owned electric system might have done).

If TVA could have issued \$1.2 billion of long-term debt in 1960, it would have paid an interest rate of approximately 4.40 percent (the rate TVA was required to pay on its first public bond issue in November 1960). Because the interest rate for this long-term debt would have been fixed, TVA ratepayers could have avoided the effects of inflation on this portion of the power program's capitalization.

Instead, because the interest rate used to calculate TVA's annual return payments varies (as provided under Section 15d(e)) with changes in the Treasury Department's average current cost of money, TVA ratepayers have had to pay substantially more than if they had been able to "buy out" the Government's investment in 1960. The total of actual TVA return payments, as of the end of fiscal year 1984, has been \$1,508,303,000. Debt service on the same amounts of outstanding borrowings at an interest rate of 4.40 percent over the same period would have totaled only \$1,090,252,000, a difference of over \$418 million (approximately 28 percent less).

From these comparisons it is clear that TVA's ratepayers are not being subsidized as a result of the Federal investment in the TVA power system prior to 1959.

2. TVA's Borrowings from the Federal Financing Bank

From 1960 to TVA's first sale of its power system bonds to the Federal Financing Bank in 1975 (at the request of the Treasury Department), TVA sold its power system bonds to the public at interest rates determined by the bond market. The fact that TVA is able to sell its bonds to the FFB at lower rates than it would currently have to pay to private investors does not, in and of itself, mean that TVA is receiving a subsidy from the Federal Government. Under the Federal Financing Bank Act of 1974, instrumentalities of the Federal Government (including TVA) borrow from the FFB at interest rates established by the Treasury Department, taking into consideration the current average yield on outstanding marketable obligations of the United States of comparable maturity. Consequently, the rates paid by TVA, which are funded entirely from power system revenues, fairly compensate the Treasury Department for its cost of money.

In addition, the FFB "is authorized to charge fees for its commitments and other services adequate to cover all expenses and to provide for the accumulation of reasonable contingency reserves." The FFB charges a fee of one-eighth of 1 percent, which is added to the interest rate calculated by the Treasury Department. In reality, because of the FFB's low overhead, nearly all of the proceeds of this fee have been routinely turned over to the Treasury Department as revenue.

To date TVA has paid \$91 million in such fees to the FFB. Based upon the TVA bonds currently held by FFB, the present value (using an 11-percent discount rate) of TVA's total future fee payments is \$114 million. Therefore, the Federal Government effectively makes a significant profit from its purchase of TVA power system bonds by, in effect, borrowing money at one rate and investing it in TVA bonds at a higher rate.

62. **Question:** a. Please explain the relationship between the Tennessee Valley Authority and the other members of the North Alabama Coal to Methanol consortium. I am particularly interested in the role that the Kidder-Peabody Company played in forming the consortium. Specifically, please state the nature of TVA's contract with Kidder-Peabody, what their obligations were under the contract, and how much compensation they received from TVA.

Answer: As originally envisioned, the North Alabama Coal-to-Methanol Plant (NACMP) was to be fully funded by the Federal Government through appropriations to TVA. However, at the direction of Congress in 1981, TVA began examination of alternate funding arrangements for the NACMP to enable its transfer to a consortium of a limited number of private equity sponsors. Thus, the project concept shifted from one entirely financed by the United States and operated by TVA to one funded, owned, and operated by a private entity with financial assistance from the Synthetic Fuels Corporation (SFC).

Beginning in March 1981 TVA worked with a number of entities to explore alternative means of private financing and operation, and to seek their assistance in developing detailed engineering and design specifications for a technologically and economically viable, state-of-the-art coal-to-methanol plant. A chronology of NACMP participation is contained in the response to question 52. The consortium's early structure was outlined in a series of consortium arrangements which were modified from time to time as membership in the consortium changed and to take account of technical developments and project economic outlooks. As of August 1983 commitments for 90 percent of project equity funding, apportioned among Air Products and Chemicals, Inc., Houston Natural Gas Corporation, Raymond International, Inc., and Peabody Coal Company, had been obtained. These consortium arrangements also established a working committee of consortium members to carry out project-related business on behalf of the consortium. It is through this committee structure that TVA regularly interacted with the consortium to ensure efficient coordination of ongoing project activities, including process selection, coal testing, environmental qualifications, and plant design, and to realize a smooth transition of plant funding and ownership to the private sector.

In furtherance of the NACMP, TVA engaged over 50 contractors for the supply of materials, supplies, and specialized services, such as architectural engineering, design, construction, research and laboratory work, and financial analyses. Four of these contractors or their subsidiary firms were associated with the consortium, though two were awarded contracts before their association with the consortium.

Kidder, Peabody & Company's role in the NACMP was established early in the consortium's formation. The House Appropriations

Committee recognized the role of Kidder in promoting the project and establishing the consortium:

A major Wall Street investment firm has analyzed the project and found it to be economically and financially favorable. They have agreed to be the financial agent for the consortium. On behalf of the consortium, the members of which have not yet been finalized, this investment firm has submitted a proposal to the United States Synthetic Fuels Corporation for financial assistance [H.R. Rep. No. 29, 97th Cong., 1st Sess. 140 (1981)].

As early as March 1981, and without compensation, Kidder undertook to identify potential consortium members and to assist in the continuing formation of the consortium and the possible transfer of the project thereto, perform financial and other analyses necessary for the purposes of responding to the SFC, present the project to potential consortium members, and provide data and information to members of the consortium and potential leaders to the consortium. Under early consortium arrangements, Kidder was recognized as the exclusive agent for the consortium responsible for arranging both equity and debt capital investments in the project and the sole lead manager of the group of underwriters organized for the purpose of marketing any securities to be issued in connection with the project. Though Kidder was to be finally compensated by the Consortium according to a percentage of the consortium members equity contribution to the project, such percentage was never established.

In order to efficiently respond to inquiries from the SFC and to coordinate efforts in support of the formation of the consortium, TVA and Kidder entered into a December 1981 cooperative agreement to share oral and written reports pertinent to the project and to work together in preparing various project documents. TVA was to reimburse Kidder only for the expense of obtaining studies and data pertaining to the impact of tax laws and regulations on private businesses who may wish to participate in the project and for certain document printing costs. Kidder was reimbursed \$146,000 for these services.

Upon completion of the work under the above-mentioned agreement and having worked with Kidder for over two years in seeking private equity sponsors for the WACMP, TVA entered into a June 1983 cooperative agreement to gain the benefit of Kidder's considerable knowledge and experience in investment banking, especially as it pertained to the project. Under this agreement, TVA and Kidder agreed to share certain costs in promoting the project, seeking equity contributions for the consortium, conducting studies to support the formation of the consortium, and supporting the consortium's application to the SFC. All tasks were accomplished in accordance with mutually agreed to workplans specifically directed to project needs. The agreement provided that any funds paid by TVA could be used as a credit against any

consortium obligation to Kidder in the event the project was successfully transferred. Kidder will receive \$644,000 under this agreement.

Question: b. What lessons has TVA drawn from the consortium experience? Does the role that TVA played in the consortium fall within the bounds of TVA's statutory authority? What lessons does TVA draw from this experience in terms of prospective policy?

Answer: TVA's work in cooperation with the consortium resulted in the accomplishment of detailed design and engineering plans for a technologically superior, state-of-the-art, commercial-scale coal-to-methanol plant. Continuous technological review and updating throughout the course of the project through close coordination between TVA and the consortium produced significant advances in coal-to-methanol technology.

Coordination between TVA and the consortium required consideration of numerous parties' interests in the advancement of coal-to-methanol production technology. TVA's cooperative efforts with the consortium were in furtherance of a congressional directive for TVA "to continue arrangements necessary to establish a private-equity Consortium to finance, own, and operate (the project)." H.R. Rep. No. 29, 97th Cong. 1st Sess. 140 (1981).

That TVA is authorized under the provisions of the TVA Act of 1933 to participate in the NACMP is without question. Section 22 of the TVA Act specifically authorizes TVA to conduct demonstrations for the purpose of furthering the proper use, conservation, and development of the natural resources of the Tennessee Valley region, and for providing for the general welfare of its citizens. Since coal is one of the most important resources of this region, TVA's involvement in the project will most assuredly aid the proper use, conservation, and development of this resource. Furthermore, energy independence will promote the general welfare of the region. Section 10 of the TVA Act authorizes TVA to make studies, experiments, and demonstrations to promote the wider and better use of electric power and to cooperate with organizations in the application of electric power to the fuller and better balanced development of the resources of the region. The replacement of electric energy with other, more economically efficient forms of energy such as that envisioned by coal gasification technology most certainly is material to such undertakings. Additionally, the Energy Security Act of 1980, in creating the SFC, specifically points out that "the achievement of energy security for the United States is essential to the health of the national economy, the well-being of our citizens, and the maintenance of national security" (Sec. 100(a)(1)) and that the act is intended to "reduce the threat of economic disruption from oil supply interruptions and increase the Nation's security by reducing its dependence upon imported oil" (Sec. 100(b)(1)). TVA's

ability to provide abundant energy is a substantial contribution to maintaining the Nation's security. The "better use of electric power" encouraged under Section 10 of the TVA Act and TVA's historic contributions to national security as evidenced in Section 20 of the TVA Act is consistent with Congress' above-mentioned findings under the Energy Security Act.

It is within this framework that TVA's technical and financial leadership were necessarily blended with private sector marketplace demands. This interaction with various members of the consortium increased TVA's sensitivity to private sector interests. With the wide array of interests represented in a consortium arrangement, the need for close coordination among the parties became imperative in order to develop a unified approach necessary to carry out the objectives of the project.

Though the project stands short of actual construction, the results obtained through detailed engineering and design of the NACMP stand readily available for application if and when circumstances arise that make coal-to-methanol production necessary. Accordingly, TVA has taken the steps necessary to make the NACMP a part of the Nation's defense energy reserve. TVA is also studying the feasibility of production of alternate fuels other than methanol to increase the flexibility of the project in the event of any future need.

THE FOLLOWING ARE QUESTIONS SUBMITTED
TO TVA BY SENATOR BURDICK.

Question: Please provide a brief description, on national benefits derived from the natural resources demonstration programs conducted at Land Between The Lakes.

Answer: Because of its flexibility in management, unique mission, and availability of a broad range of expertise, LBL is an ideal outdoor national laboratory. For example:

- The National Science Foundation has selected LBL to be a component of the National Experimental Ecological Reserve (EER) Network.
- The eagle restoration project, begun in 1980, has demonstrated that an endangered species--the bald eagle--can be conditioned for successful release into its former breeding range and will return to nest in the adopted area. As a result of this experience, Eagle Trust, International, a nonprofit organization will be moving its operations to LBL in September of 1985.
- LBL has worked with recreation equipment manufacturers to test and improve their products.
- LBL, in conjunction with USDA, currently has a large-scale four-year pilot project underway to determine the most effective methods for controlling ticks--a growing health and pest problem in recreation areas throughout the southern and southeastern States.
- Primarily because of its unique forest management program, LBL has been involved with an international training program in natural resources for government officials in developing countries (primarily Africa and South America) on a reimbursable basis.
- LBL's intern program, begun in 1964, has trained over 800 students from all over the United States and abroad in the areas of environmental education, computer science, fisheries, graphic design, journalism, and numerous other fields of education and application.
- Each year some 350 students and 45 faculty representing 30 universities and colleges participate in six consortium programs at LBL.
- LBL provides answers to environmental questions, tests innovative techniques, and provides leadership training in recreation, education, and natural resource management.
- LBL's demonstrational role is not completed, nor will it ever be completed, as long as there are resource-related questions to be answered, problems to be solved, and information to be disseminated. TVA's flexibility, the diversity of employee expertise, which ranges from entomologists to educators, and close working relationships with cooperators such as universities and other government agencies at all levels, make TVA just as appropriate to continue the demonstrational role of LBL now as when the Secretary of Interior recommended TVA develop LBL in 1963.

Question: How do TVA's power rates compare with the surrounding areas?

Answer: The following tables are submitted for information.

APRIL 1985
COMPARISON OF RESIDENTIAL POWER COSTS
TVA AND UTILITIES IN THE SOUTHEASTERN US
1,000 KWH

FLORIDA POWER CORP.	\$80.58
TAMPA ELECTRIC CO.	\$77.44
GULF POWER CO.	\$77.28
SOUTH CAROLINA ELECTRIC & GAS CO.	\$75.16
CAROLINA POWER & LIGHT CO. (SC)	\$72.62
SAVANNAH ELECTRIC & POWER CO.	\$72.50
CAROLINA POWER & LIGHT CO. (NC)	\$69.99
ARKANSAS POWER & LIGHT CO.	\$68.58
ALABAMA POWER CO.	\$68.44
VIRGINIA ELECTRIC & POWER CO.	\$68.23
CENTRAL LOUISIANA ELECTRIC CO.	\$67.36
GULF STATES UTILITIES CO.	\$66.09
DUKE POWER CO. (NC)	\$66.10
MISSISSIPPI POWER & LIGHT CO.	\$65.22
SOUTHWESTERN ELECTRIC POWER CO.	\$61.22
MISSISSIPPI POWER CO.	\$60.96
DUKE POWER CO. (SC)	\$59.96
LOUISVILLE GAS & ELECTRIC CO.	\$59.46
APPALACHIAN POWER CO.	\$59.21
GEORGIA POWER CO.	\$58.96
LOUISIANA POWER & LIGHT CO.	\$58.30
NEW ORLEANS PUBLIC SERVICE, INC.	\$57.20
KENTUCKY UTILITIES CO.	\$55.74
KENTUCKY POWER CO.	\$52.94
KINGSPORT POWER CO.	\$51.35
TVA RP-K	\$47.08

NOTE: Bills for others are based on applicable residential rate information obtained directly from the utilities. Bills include all currently applicable adjustments and charges except local and state sales taxes. TVA rate level RP-K is typical of basic residential bills in TVA service area; amount may vary in particular locations due to rate level difference and application of special charges.

1,000 Kwh is a utility comparison standard nearest to the average use in the Tennessee Valley. At higher or lower use levels, TVA rates may compare more or less favorably.

TVA\QP&E\ROS

APRIL 1985
COMPARISON OF INDUSTRIAL POWER COSTS
TVA AND UTILITIES IN THE SOUTHEASTERN U S
20,000 KW AND 13,140,000 KWH

GULF STATES UTILITIES CO.	\$693,560
TAMPA ELECTRIC CO.	\$681,398
SAVANNAH ELECTRIC & POWER CO.	\$664,864
FLORIDA POWER CORP.	\$656,341
CENTRAL LOUISIANA ELECTRIC CO.	\$624,772
CAROLINA POWER & LIGHT CO. (SC)	\$603,603
MISSISSIPPI POWER & LIGHT CO.	\$601,951
CAROLINA POWER & LIGHT CO. (NC)	\$601,809
GULF POWER CO.	\$580,805
SOUTHWESTERN ELECTRIC POWER CO.	\$570,561
NEW ORLEANS PUBLIC SERVICE, INC.	\$560,595
LOUISIANA POWER & LIGHT CO.	\$555,675
MISSISSIPPI POWER CO.	\$552,534
ARKANSAS POWER & LIGHT CO.	\$544,831
SOUTH CAROLINA ELECTRIC & GAS CO.	\$524,425
DUKE POWER CO. (NC)	\$523,307
LOUISVILLE GAS & ELECTRIC CO.	\$508,672
ALABAMA POWER CO.	\$504,319
KENTUCKY UTILITIES CO.	\$501,419
TVA GP-K	\$495,132
GEORGIA POWER CO.	\$491,011
DUKE POWER CO. (SC)	\$489,128
VIRGINIA ELECTRIC & POWER CO.	\$475,113
KINGSPORT POWER CO.	\$451,575
APPALACHIAN POWER CO.	\$411,468
KENTUCKY POWER CO.	\$388,580

NOTE: Bills for others are based on applicable industrial rate information obtained directly from the utilities. Bills include all currently applicable adjustments and charges except local and state sales taxes. TVA rate level GP-K is typical of basic industrial bills in TVA service area; amount may vary in particular locations due to rate level difference and application of special charges.

This usage level is a utility comparison standard. At higher or lower use levels TVA rates may compare more or less favorably.

TVA\OP&E\RD5

Utilities With Canceled Units

Utility	Nuclear Units		
	Canceled	Under Construction or Operating	Percent Canceled
1. San Diego Gas and Electric.....	2	0	100
2. Potomac Electric Power.....	2	0	100
3. Ohio Edison.....	2	0	100
4. New England Power.....	2	0	100
5. New York State Electric and Gas	2	0	100
6. Public Service of Oklahoma.....	2	0	100
7. Puget Sound Power and Light.....	2	0	100
8. Cincinnati Gas and Electric....	2	0	100
9. Public Service of Indiana.....	2	0	100
10. Delmarva Power and Light.....	2	0	100
11. Northern Indiana Public Service	1	0	100
12. Gulf States.....	3	1	75
13. Alabama Power Company.....	4	2	67
14. Boston Edison.....	2	1	67
15. Wisconsin Public Service.....	2	1	67
16. Toledo Edison.....	2	1	67
17. Detroit Edison.....	2	1	67
18. Portland General Electric.....	2	1	67
19. Jersey Central Power.....	2	1	67
20. Long Island Lighting Company...	2	1	67
21. Virginia Electric and Power....	4	4	50
22. Public Service Electric.....	3	3	50
23. Houston Power and Light.....	1	1	50
24. Omaha Public Power District....	1	1	50
25. Rochester Gas and Electric.....	1	1	50
26. Union Electric.....	1	1	50
27. Illinois Power.....	1	1	50
28. Tennessee Valley Authority.....	8	9	47
29. Duke Power.....	6	7	46
30. Carolina Power and Light.....	3	4	43
31. Northern States Power.....	2	3	40
32. Arizona Public Service.....	2	3	40
33. Washington Public Power Supply System.....	2	3	40
34. Consumers Power.....	2	4	33
35. Philadelphia Electric.....	2	4	33
36. Northeast Utilities.....	2	4	33
37. Georgia Power.....	2	4	33
38. New York Power Authority.....	1	2	33

Question: Discuss briefly how TVA establishes those rates and whether or not the seven state public service commissions, citizens, and industry are consulted.

Answer: TVA operates its power program in accordance with its statutory mandate to develop, conserve, and utilize the resources of the Tennessee Valley region for the benefit of the people. The power system plays an integral part in achieving these goals. In furtherance of these efforts, the TVA Board, as provided for in the TVA Act, has the responsibility for establishing the rates and charges for electric power that will carry out the purposes and satisfy the requirements set out in the Act. In this regard, all decisions involving rates reflect the statutory requirements that TVA's rates be kept as low as feasible, meet all the financial tests required under the Act and TVA's Basic Bond Resolution, and still take into account TVA's responsibility to provide an ample supply of electric power for the area it serves. In carrying out its ratemaking responsibility TVA makes a concerted effort to provide the general public, industry, and any other interested individual or organization with full information on rate actions being considered and also provides opportunities for all such entities to provide input to assist the TVA Board in its rate determinations.

Rate adjustments and changes are made in accord with provisions set out in the wholesale power contracts with the 160 municipal and cooperative distributors of TVA power. In addition to the reviews and discussions provided for therein with the distributors and their representatives, TVA, prior to any action of the Board involving rates, also provides information to representatives of the industries served directly by TVA as well as to the general public and interested organizations. Opportunity is provided for views and comments which can be included in the ratemaking considerations. Of course, any action by the TVA Board on rate matters is only taken in open Board meetings, at which time there is further opportunity for public comment.

TVA's power program probably has more opportunity for public input into the ratemaking process than any other major power supplier. With the exception of a few very large directly served users, all of TVA's electric power is sold to the ultimate consumer through the municipally or cooperatively owned distribution systems. Most of these user-owned distributors are small enough to be in close personal contact with their individual consumers, and their managers or other representatives convey these consumers' viewpoints to TVA. In addition, any consumer, organization, or other entity has the opportunity to communicate directly with TVA Board members and senior TVA officials in conjunction with TVA's rate reviews, as well as at any of the regular meetings of the TVA Board that are all open to the public. The public also has the opportunity to ask questions, present views or comment on TVA electric rates and policies through the toll-free telephone line provided under TVA's Citizen Action Line program or through direct contact with TVA's Citizen Advocate.

Question: Regarding the nuclear power section, it has not received many passing grades lately by the Nuclear Regulatory Commission. The problems are serious. I would hope that the Subcommittee on Nuclear Regulation would review this matter.

However, it is my understanding that a major part of the problem is TVA's inability to pay top and mid-level managers the wages currently offered by private utilities. What actions have been taken by the Board to get this and other management problems under control?

Answer: Yes, TVA considers the limitations of pay to top and midlevel nuclear managers to be a major factor in our nuclear problems. Under current congressional limitations, no TVA employee is to receive a salary in excess of that paid to a member of the TVA Board. In recent years, a "half dozen" senior nuclear managers have left TVA to assume vice presidencies at private utilities with salaries averaging \$140,000 to \$150,000 a year. The Federal pay ceiling problem has been raised with congressional members and especially with the subcommittee during the recent oversight hearings held during July 15 and 16. At the present time, the Federal pay ceiling limits TVA's ability to competitively recruit and retain both middle and upper level managers for key nuclear positions.

Early in July, the TVA Board made a decision to place the necessary nuclear management talent into the most effective and responsive team possible in order to strengthen the nuclear management program. With this in place, TVA should meet concerns expressed by the NRC regarding fragmented responsibility and lack of responsiveness. Previously, nuclear activities were under several organizational units. The TVA Board assigned sole responsibility for management of TVA's entire nuclear program to H. G. Parris. Additional management expertise has been provided and personnel changes made in the nuclear management program. Other changes are in progress and will continue to be made to strengthen the nuclear management program. To implement the over-all program, an extensive new management concept called the owner-operator concept will be utilized. Its primary objective is to clearly delineate responsibility, authority, and accountability. The mechanics have been established through a performance monitoring program to track, at a corporate level, nuclear plant and site support progress.

Question: TVA has been heavily involved in the economic development of the seven-State area. Please highlight what you think are some of the major successes and achievements of your economic development program.

Answer: Most of TVA's programs are ultimately concerned with the economic potential and development of the Valley region. In this sense, the integrated development of the river system would certainly be TVA's greatest economic achievement. In a more narrow sense, through TVA skills development partnership arrangements, a minimum of 11,000 individuals annually are being trained and placed in occupations ranging from basic manufacturing to advanced technologies. The average cost to TVA per trainee placed in private sector jobs has averaged \$364 with 11,000 Valley residents being placed annually at an average hourly wage of \$8, resulting in over \$121 million in wages being generated into the Valley economy. Based upon a minimum of 10 percent return in Federal taxes, these efforts generate over \$12 million return to the Federal government. This equals a \$4 return on every Federal dollar invested in the TVA skills development program. In addition, State and local revenues receive about \$2.5 million in taxes due to these efforts.

The rural character of the Valley region is punctuated with nearly a fourth of the region's counties facing extremely high unemployment levels and low per capita income. In 1983 and 1984 TVA, working in these 50 counties with local groups to take advantage of local resources, was able to assist in the creation of 2,500 private sector jobs through business start-ups and expansions. This resulted in \$25 million of direct annual payroll wages with total economic benefits of over \$40 million. This represents a return of \$10 for every dollar of the public's investment. In 1985 we expect the special opportunities counties and cities program to help create more than 5,000 new jobs.

In 1984 a pilot program was initiated to stimulate new jobs in existing Valley industry through helping plant managers lower operating costs and plan for new expansions. This program, conducted in cooperation with eight TVA power distributors, offered services which include energy management surveys, transportation rate analyses, preliminary civil engineering assessments, water supply and waste disposal, air pollution control, employee training, and financial resource identification. As a result of working with 87 manufacturing firms that provide 200 services, 2,500 new jobs were created. Based on the success of this demonstration, these efforts have been expanded Valley-wide in 1985. Through the third quarter of this fiscal year, 188 businesses are participating in the program, with in excess of 6,800 new jobs projected from planned expansions.

Other successes include TVA's solid waste management program which helped over half of the Valley region's 201 counties convert from open dumps to State-approved sanitary landfills; the rural fire protection demonstration, which helped establish a dozen countywide rural fire protection systems that are still thriving and saving lives, property and insurance costs; the Duffield Industrial Park in which three impoverished counties cooperated to achieve industrial diversification in the coal fields of southwest Virginia; the Townlift program which has created jobs and upgraded the appearance and functioning of the downtown areas of over 200 communities across the Valley, and served as the model for a national program--the National Trust for Historic Preservation's "Main Street USA" Program; and the community health program which brought doctors to rural areas, provided health screening for thousands of rural residents, established clinics where no medical facilities existed, and upgraded the services and viability of small rural hospitals.

Question: The State of North Dakota is interested in working with existing industries to increase employment opportunities for our residents. Could TVA's existing industries program be adapted to fit in with North Dakota's goal? If yes, what technical expertise could TVA offer the State?

Answer: Yes, TVA's existing industries program could be adapted to fit in with North Dakota's goal of working with existing industries to increase employment opportunities for their residents. One of the things we are proudest of accomplishing through the existing industries program is the marriage of three TVA objectives: the efficient use of energy, the need to preserve environmental quality, and the need for more jobs for Valley region residents. The program has been greeted enthusiastically by more than 250 plant managers in the past 2-1/2 years, and the program has helped create over 10,000 new job opportunities in the TVA region.

TVA's existing industries program has received interest from many economic development organizations and State and local governments all over the country. Information on how to develop and operate an existing industries program such as TVA's has been shared with these organizations. TVA staff will make this same information and technical assistance available to the State of North Dakota as well as any other State interested in TVA's existing industries program. TVA is always pleased to share its successes with others across the Nation and the world.

Question: How does TVA make other Federal agencies, states, industries, and private organizations aware of its (fertilizer) research? Are there other government programs or private groups duplicating any of TVA's research programs?

Answer: First and foremost, private firms purchase in excess of 150,000 tons of experimental fertilizer products from TVA annually. TVA disseminates its research information through publications in scientific and trade journals, presentation of papers at technical conferences and scientific meetings, joint research meetings with industry, universities and other government organizations, daily correspondence and telephone calls to and from technology users, and personal contact with 1,500-2,000 annual technical visitors. Moreover, a biennial fertilizer technology demonstration is attended by several hundred engineers and scientists from throughout the world.

TVA maintains a small technical staff to work with land-grant university researchers, industry, and the farmer across the United States. TVA contracts with these universities to test experimental fertilizers under different types of soils and climates and on different crops. Benefits of new fertilizers and fertilizer application practices are quickly seen by the farmer--the ultimate user.

TVA maintains a staff of chemical engineers that interface with the fertilizer industry to assist in adoption of new TVA research and to solve process and operating problems.

TVA's system of technology transfer has proven to be an effective and efficient means of quickly getting research to the farm. Nevertheless, TVA continues to study ways to further improve its efforts in this area.

The National Fertilizer Development Center is the only public sector facility in the U.S. that combines agricultural and industrial research, is national in scope, and employs a Federal, State, and private sector partnership for fertilizer technology development and transfer.

No other government or private group is duplicating TVA's fertilizer research.

Question: If TVA nonpower programs were eliminated, what programs do you think Tennessee Valley States would take over?

Answer: OMB's fiscal year 1986 budget recommendation for TVA assumed that TVA programs were duplicative of those conducted by other Federal or State agencies. That assumption simply is not correct. Consequently, the Valley States would have to undertake new programs (many outside the realm of typical State efforts) at considerable additional expense if they were to attempt to fill the void which would be left if TVA's nonpower programs were eliminated. It would not appear at this time that the Valley States would be likely to undertake such new programs.

To reduce the possibility of duplication, TVA has established memoranda of understanding with the Valley States in areas such as water management and economic development to clearly define the respective roles of each so that efforts will be concentrated in the most appropriate areas for each party. If important sources of State funding such as Federal revenue sharing are being reduced, the Valley States will have to make important budgetary decisions for funding their existing programs and services and will be unlikely to assume responsibility for any programs or activities discontinued by TVA.

Moreover, TVA programs like fertilizer research and development, reservoir releases improvement, and operation of our reservoir system clearly have national scope. The operation of such national-scale programs is generally beyond the financial capability of the States and should not logically be the responsibility of individual States.

With regard to its demonstration programs, TVA focuses on developing and testing new approaches to resolving problem areas which would not only be suitable for adoption by State and local governments in the Valley region, but also could be adopted by other Federal, State, or local agencies or the private sector. Examples include the products of our fertilizer research, the transfer of reservoir recreation areas, establishment of university-based centers for environmental and energy education, and the recently established Forest Resource System Institute. It does not seem likely that the Valley States have sufficient available funding or willingness to embark on such national demonstration efforts.

Question: TVA has established a toll free hotline and hired local representatives to serve as ombudsmen between residents and TVA. Have they proved beneficial? Do you think individuals, and small and local governments have adequate means to voice objections to TVA policy or operating procedures? If not, what can be done to improve communication lines?

Answer: Over the past eight years TVA has made a major effort to increase its accessibility to the public and to encourage public participation in its decisions and policies. In 1979 it established the Citizen Action Line, a toll-free telephone service with a trained staff of 15 to take comments, answer questions, and help solve TVA-related problems for people throughout the seven-State area. Last year this staff handled about 83,000 calls. Of these, 2,500 involved complaints, problems, or comments on issues, all of which are summarized and reported to management. The rest were requests for information.

This staff is part of TVA's Citizen Action Office, which also handles the planning for about 90 public meetings a year. These include regular TVA Board meetings, public input sessions on general issues or localized matters, and meetings to get the views of people and organizations with interests in various areas of TVA responsibility--business and industry, environmental organizations, local public officials, and so on.

In 1979 TVA established seven district administrative offices across the Valley region to provide closer access to TVA for both members of the public and public officials. These District Administrators handle questions and suggestions, help people contact the appropriate TVA staff to deal with a specific matter, and generally coordinate TVA's activities in each district.

In 1984 TVA appointed a Citizen Advocate to help reach citizens who are unorganized or lack an established voice to make their opinions known in areas involving TVA.

These measures have added to TVA's conventional channels for citizen communication, such as appearances by TVA Board members around the region, letters to TVA, congressional inquiries on behalf of constituents, and circulating comments published in the news media among TVA's Board and staff. We believe these measures have helped TVA recognize the various views and priorities of people in the region.

Question: If research information is essentially free to all producers, why must TVA produce fertilizer materials beyond the pilot-program stage? Is the fertilizer industry composed of many small producers or concentrated in larger companies?

Answer: We produce fertilizers in small prototype plants to complete the research and development of a new product past the pilot-plant stage. Many aspects important to determining the commercial viability of new fertilizer technologies can only be fully tested at this point. As part of this effort, cooperating industry firms and universities share with us information on their experiences with a new product or process. This information is used in completing the R&D process. Nearly every TVA development has been significantly improved at the prototype stage based on the real-world experiences of the fertilizer industry, universities, and farmers. Moreover, the TVA approach of "following through" on its technological innovations is important for several additional reasons:

- Substantial risks are involved in scaling up to commercial size from pilot plants . . . industry firms are reluctant to commit capital to a new process until R&D is completed.
- Operation of a new process on a prototype scale lets engineers refine the method . . . provides industry better estimates of commercial potentials . . . provides enough fertilizer for widespread testing and market development.
- Demonstration of a market demand is required to stimulate commercial production.
- Cooperating firms pay for TVA fertilizers from prototype plants and assume all costs--which are sometimes substantial--in adapting their plants and/or application equipment for new technology.
- Commercial distributors need to be assured of sufficient quantities of experimental fertilizers for a period of three to five years.

In the U.S., the fertilizer industry is composed mainly of small producers located near the use point. Any large plants are usually located near phosphate mines and along coastal areas and either ship fertilizer intermediates to the smaller plants or manufacture one of the few select commodity fertilizers products, such as diammonium phosphate.

Question: Can the average producer afford to contract individually with TVA for research services? Are fertilizer producers concentrated in certain areas of the country or spread out geographically?

Answer: The small producer cannot afford to enter into special contracts with TVA for research (or any other entity, for that matter). Their operations are based on small throughputs and low profit margins. Further, the industry is highly competitive. TVA technology is the basis for and backbone of most small producers. TVA technicians interface frequently with these producers to assist in refining chemical processes which yield more effective and efficient plant operations. Without this TVA assistance, small producers could not remain competitive. Many would not be able to continue operating, with the net result being an increase in fertilizer prices to the farmers.

Basic fertilizer producers (usually large companies) are concentrated in and around waterways and raw material deposits and sources. Small producers are located in and around use areas. A large number are in the Midwestern farm belt with a smaller number in the Southeast, East, and far West areas.

Question: Most people agree that your research programs in the past had significant impact on the fertilizer industry and on American agriculture. What significant impacts from your present R&D do you foresee developing in the next five years?

Answer: A ten-year program to increase nitrogen utilization efficiency was initiated in 1979. Also, in the late 1970s research was initiated to develop technologies to recover future, low-grade U.S. phosphate ores to maintain the viability of this industry. Both were long-range efforts. They and other research programs should have the following significant impacts in the next five years:

- More efficient nitrogen fertilizers such as urea-nitric phosphates and urea containing nitrogen-loss inhibitors will be demonstrated to the U.S. agricultural industry. Hopefully, they will improve the present inefficient use that is costing U.S. farmers over a billion dollars annually and contributing to the nonpoint pollution problem.
- Promising phosphate beneficiation technology will be demonstrated to the Florida phosphate industry using a portable research unit. Assistance will be provided in modifying commercial plants to use this more efficient and economical technology thereby avoiding possible plant shutdowns or more expensive modifications.
- New higher analysis suspension fertilizers such as UAN (36-0-0), UAS (29-0-0-5S), and ammonium polyphosphates (11-30-0-3S and 12-38-0) will be introduced to the U.S. fluid industry to incorporate the benefits of higher analysis, lower production cost, and lower energy consumption.
- New fertilizer granulation technologies such as the falling-curtain process for urea and possibly ammonium polyphosphate and the pipe-cross reactor (ammonium phosphates) will be introduced to reduce investments for new plants (curtain granulation and pipe-cross) and operating costs (pipe-cross) for existing plants.
- New solid and fluid fertilizers will be tested on the farm for the most efficient use in minimum tillage agriculture and to reduce non-point pollution caused by fertilizers.

Question: It is my understanding that the tax would need to be roughly \$1 per ton. Is that correct? How does that compare to the average cost of fertilizer on the market? Can the American farmer afford to pay this tax?

Answer: With about 50 million tons of fertilizer sold to farmers annually, \$1 per ton would fund the NFDC program and perhaps provide sufficient funds to cover administrative costs if administration were handled through existing organizations.

The average per ton cost of fertilizer in the market place is \$200.

Such a tax would mean that U.S. farmers would have to pay an additional \$50 million in production expenses. While the farmer could probably afford such a tax it is highly unlikely that farmer or industry organizations would support a tax because of the economic difficulty already facing farmers and farm suppliers.

Question: In addition to the fertilizer research, the Muscle Shoals Center is conducting research on hard wood and grain fuels. Is it practical to think that in the near future, individual farm operators would be able to produce their own ethanol in order to reduce operating costs?

Answer: Yes, within the next five to ten years, we believe technology will be developed that will enable the farmers to produce ethanol from agricultural crops which will help them to become self-sufficient in energy consumption on the farms. Potential for profitable ethanol production exists through further research and development. It likely will require plants of a size larger than an individual farm operator to be profitable. However, the key is to provide profitable markets for farm and forest crops. By approaching the opportunity from an integrated systems concept and by producing multiple products to enhance economics including ethanol, new cash markets would be opened for farmers and forest land owners. TVA is actively engaged in laboratory studies and pilot plant tests (2-4 tons/day of feedstock) on the production of ethanol from wood and agricultural residues; the latter activity is also supported by DOE.

Question: As a side light, this committee is also holding oversight hearings on the highway program. We have been told that the gasohol exemption is costing the trust fund at least \$200 million a year. Does your research indicate that ethanol can be marketed someday without government support for the industry?

Answer: Yes, our research indicates that the potential exists for ethanol to be produced and marketed in a free market system. Ethanol is used as an octane enhancer and fuel extender and the likelihood that it can be marketed in the next decade or so without government subsidy is real if funding for appropriate research and development is available. Wood, of which this country has an abundant unused supply, and agricultural materials and residues are choice feedstocks for ethanol production.

Question: Do you know what the average cost of production is for foreign countries?

Answer: No. Accurate information on the cost of production of ethanol (gasohol is a mixture of ethanol and gasoline) is very difficult to obtain. Brazil is the major exporter of ethanol to the United States. In a recent article in Chemical and Engineering News (April 22) domestic interests claimed that Brazilian imports are able to undercut the United States market because their fuel ethanol industry is heavily subsidized, from production to exports. They further reported that because of the subsidies Brazilian importers are selling fuel ethanol in the United States for only 39 percent of its foreign market value. On the other hand, a recent publication by Brazil denies subsidization and indicates production cost of under \$1 per gallon.

Ethanol is also produced from petroleum resources in places like the Middle East. However, this relies on a "stock" resource and provides no relief from imports. Whereas, biomass and other renewable technologies are tied to a "flow" resource and can be produced domestically.

Question: If Congress restricts TVA's program to power, what impact could this have on the Valley States?

Answer: Loss of appropriated funding would eliminate such programs as the Nation's only fertilizer research, development, and technology introduction program. The TVA fertilizer program has cooperative arrangements in all Valley States with fertilizer manufacturers and distributors, farmers, and land-grant universities through which agronomic research and development is performed. The elimination of this program would not only affect the future of agriculture in the Valley States but the Nation--indeed the world--as well.

Such a decision by Congress would also eliminate the reservoir system operations program through which TVA operates and maintains the integrated waterway system in the Valley. This program is critical to maintaining a proper balance of flood control, navigation, recreation, and power generation on the Tennessee River and its tributaries.

TVA's natural resources and economic and community development programs would also be eliminated. Land Between The Lakes and activities conducted jointly with the States, such as forestry and wildlife resources development and skills development for the training of Valley residents to take high-technology and industry-specific jobs, would be eliminated. Minority economic development and other community development projects which are designed to help Valley residents generate economic activity in the hope of moving closer to the average income level of the rest of the Nation would also be eliminated.

It is not likely that the Valley States or anyone else could duplicate or assume the role of TVA's national fertilizer development program on a timely basis or as efficiently and effectively as it is now operated. It is possible that the U.S. Army Corps of Engineers could assume some of the TVA role in maintaining TVA dams and reservoirs, but again not as efficiently as that duty is now performed by TVA because of the integrated nature by which TVA conducts its operations. Individual Valley States would probably expand their scope of activity adopting some of the present TVA demonstrations in natural resource management and development. However, where TVA has sought to resolve resource problems through the introduction of innovation and technological change, State agencies will more likely have to depend upon their regulatory authority to solve these same problems. A similar dilemma can be expected to occur in economic and community development programs. Some current TVA activities are likely to complete the transition from demonstration to adoption by State and local governments. But to an increasing extent, future initiatives will place greater reliance on other Federal programs or States will confine most of their efforts to areas with the highest priority of success, avoiding rural areas of entrenched poverty and economic stagnation that TVA has confronted. In fact, by destroying the wealth of diverse and highly skilled expertise available by virtue of TVA's broad responsibilities being delivered on an integrated regional basis, there is no way that the sum of the pieces could ever equal what is now in place.

Question: Please provide a tabulation which shows the congressional appropriations to the TVA power system, payments so far, and anticipated payments on a then-year basis and a constant dollar basis.

Answer: The requested tabulation is provided below. From this tabulation one can easily see that the terms of the 1959 change in TVA's power financing have been and will continue to be a sensible and financially beneficial arrangement for the U.S. Treasury (i.e., taxpayers).

One consideration pertinent to this issue concerns the economics of TVA's repayment of the appropriated investment in the power system as set forth in the 1959 amendment to the TVA Act. This amendment established a payment schedule which requires TVA to repay to the U.S. Treasury \$1 billion of the appropriation investment in the power system. In addition, an annual return ("dividend") based on the U.S. Treasury's average cost of money at the end of each preceding year is required. TVA has made all the payments required by the Act. At the end of fiscal year 1985, almost one-half of the \$1 billion will have already been repaid. At the end of fiscal year 1985, TVA will have made the following payments:

Return ("dividend").....	\$1,605 million
Repayment (of "investment").....	<u>430 million</u>
Total payment through 1985.....	\$2,035 million

The following analysis demonstrates that the Treasury, not TVA, is the net beneficiary of these requirements. Had TVA gone to the financial markets in 1961 and sold 25-year bonds at the then-current rate of 4.4 percent and "paid off" the Treasury investment of \$1,000 million required to be repaid, total payments on those 25-year bonds (including their repayment) would have been \$1,675 million by the end of this year, far less than the \$2,035 million which will have been paid into the Treasury at the end of fiscal year 1985. Furthermore, under the current payment schedule, \$570 million remains to be paid along with the annual return ("dividend") over the remaining 28 years of scheduled payments.

The obvious conclusion is that the Treasury has, in economic terms, recovered its costs associated with the TVA power system and that all future payments are pure "profit" to the Treasury.

TVA POWER SYSTEM FINANCING
1934-1960

FISCAL YEAR	APPROPRIATIONS BY CONGRESS	OTHER ADDITIONS TO GOVERNMENT EQUITY	PAYMENTS TO US TREASURY	US TREASURY NET CASH FLOW	US TREASURY NET CASH FLOW IN 1960 \$
1934	\$17,830,400		\$0	(\$17,830,400)	(\$47,700,486)
1935	\$17,830,400		\$0	(\$17,830,400)	(\$46,700,285)
1936	\$17,830,400		\$0	(\$17,830,400)	(\$45,741,168)
1937	\$17,830,400		\$0	(\$17,830,400)	(\$44,820,554)
1938	\$17,830,400		\$0	(\$17,830,400)	(\$43,936,459)
1939	\$22,448,000	\$8,572,500	\$60,479	(\$30,960,021)	(\$74,813,698)
1940	\$27,114,000	\$52,000,000	\$432,082	(\$78,681,918)	(\$186,009,902)
1941	\$11,509,000	\$4,500,000	\$484,602	(\$15,524,398)	(\$34,150,593)
1942	\$96,479,000		\$742,979	(\$95,736,021)	(\$191,539,413)
1943	\$53,473,000		\$2,778,291	(\$50,694,709)	(\$96,367,640)
1944	\$4,490,000		\$736,624	(\$3,753,376)	(\$6,967,223)
1945	(\$4,269,000)		\$2,726,207	\$6,995,207	\$12,676,621
1946	\$2,259,000		\$10,035,608	\$7,776,608	\$12,175,318
1947	\$3,190,000		\$10,859,348	\$7,669,348	\$10,633,335
1948	\$3,535,000		\$11,063,936	\$7,528,936	\$9,762,890
1949	\$7,797,000		\$6,035,771	(\$1,760,229)	(\$2,303,824)
1950	\$32,540,000		\$6,438,451	(\$26,101,549)	(\$33,479,769)
1951	\$106,642,000		\$9,863,991	(\$96,778,009)	(\$116,459,086)
1952	\$199,843,000		\$12,743,097	(\$187,099,903)	(\$221,922,710)
1953	\$194,367,000		\$15,674,757	(\$178,692,243)	(\$208,707,193)
1954	\$269,956,000		\$20,693,376	(\$249,262,624)	(\$287,562,423)
1955	\$196,941,000		\$50,398,437	(\$146,542,563)	(\$165,474,590)
1956	\$47,092,487		\$59,042,187	\$11,949,700	\$13,074,445
1957	\$11,372,358		\$30,000,000	\$18,627,642	\$19,709,210
1958	\$4,741,455		\$10,000,000	\$5,258,545	\$5,470,352
1959	\$3,367,621		\$0	(\$3,367,621)	(\$3,422,420)
1960	\$2,306,358		\$0	(\$2,306,358)	(\$2,306,358)
	\$1,786,346,279	\$65,072,500	\$260,611,223	(\$1,190,607,556)	(\$1,776,983,773)

TVA POWER SYSTEM FINANCING
1961-1994

FISCAL YEAR	APPROPRIATIONS BY CONGRESS	OTHER ADDITIONS TO GOVERNMENT EQUITY	PAYMENTS TO US TREASURY	US TREASURY NET CASH FLOW	US TREASURY NET CASH FLOW IN 1934 \$
1961		\$1,714,362	\$51,432,399	\$49,718,036	\$150,190,609
1962		\$393,698	\$46,541,639	\$46,147,741	\$145,991,620
1963		\$514,902	\$48,874,543	\$48,359,641	\$150,726,617
1964		\$341,520	\$50,206,432	\$49,864,912	\$153,068,903
1965		\$302,899	\$52,599,979	\$52,297,080	\$157,102,229
1966		\$381,605	\$58,873,084	\$58,491,479	\$170,216,505
1967		\$199,780	\$62,124,973	\$61,925,193	\$174,966,476
1968		\$5,740,132	\$61,861,924	\$56,121,792	\$151,883,764
1969		\$973,765	\$68,082,238	\$67,108,473	\$172,723,709
1970		\$1,464,751	\$72,648,798	\$71,184,047	\$173,877,446
1971		\$2,901,824	\$85,146,528	\$82,244,704	\$191,353,213
1972		\$3,587,193	\$75,810,390	\$72,223,197	\$161,332,177
1973		(\$14,505)	\$73,784,450	\$73,798,955	\$155,888,516
1974		\$458,134	\$83,422,241	\$82,964,107	\$161,040,339
1975		\$552,268	\$91,371,901	\$90,819,633	\$161,279,033
1976		\$313,911	\$0	(\$313,911)	(\$529,858)
1977		\$161,013	\$106,389,375	\$106,228,362	\$179,305,512
1978		\$1,014,951	\$84,016,716	\$83,001,765	\$132,187,963
1979		(\$157,714)	\$81,715,988	\$81,873,702	\$121,585,977
1980		\$496,376	\$88,867,773	\$88,371,397	\$120,795,513
1981		\$6,795,257	\$98,413,026	\$91,617,769	\$114,704,502
1982		\$974,696	\$106,416,618	\$105,441,922	\$120,417,262
1983		\$21,632,089	\$129,477,526	\$107,945,437	\$116,166,042
1984		\$1,170,241	\$126,566,909	\$125,395,668	\$130,078,516
1985		\$4,961,245	\$113,657,266	\$108,696,021	\$108,696,021
	\$0	\$56,874,593	\$1,918,302,715	\$1,861,428,122	\$3,585,249,805

TVA POWER SYSTEM FINANCING
1985-2014

FISCAL YEAR	APPROPRIATIONS BY CONGRESS	OTHER ADDITIONS TO GOVERNMENT EQUITY	PAYMENTS TO US TREASURY	US TREASURY NET CASH FLOW	US TREASURY NET CASH FLOW IN 1985 \$
1985			\$116,546,000	\$116,546,000	\$116,546,000
1986			\$114,410,000	\$114,410,000	\$109,465,510
1987			\$108,897,000	\$108,897,000	\$99,114,095
1988			\$94,875,000	\$94,875,000	\$82,220,415
1989			\$92,975,000	\$92,975,000	\$76,471,698
1990			\$91,075,000	\$91,075,000	\$71,594,591
1991			\$89,175,000	\$89,175,000	\$66,755,612
1992			\$76,653,000	\$76,653,000	\$54,660,599
1993			\$75,052,000	\$75,052,000	\$50,994,411
1994			\$73,453,000	\$73,453,000	\$47,492,191
1995			\$71,253,000	\$71,253,000	\$44,438,832
1996			\$70,253,000	\$70,253,000	\$41,403,728
1997			\$68,653,000	\$68,653,000	\$39,659,756
1998			\$67,053,000	\$67,053,000	\$36,206,803
1999			\$65,453,000	\$65,453,000	\$33,837,432
2000			\$63,853,000	\$63,853,000	\$31,570,001
2001			\$62,252,000	\$62,252,000	\$29,597,242
2002			\$60,653,000	\$60,653,000	\$27,728,742
2003			\$59,053,000	\$59,053,000	\$25,959,868
2004			\$57,453,000	\$57,453,000	\$24,116,946
2005			\$55,853,000	\$55,853,000	\$22,703,931
2006			\$54,253,000	\$54,253,000	\$21,206,298
2007			\$52,653,000	\$52,653,000	\$19,789,325
2008			\$51,053,000	\$51,053,000	\$18,450,381
2009			\$49,453,000	\$49,453,000	\$17,183,957
2010			\$47,853,000	\$47,853,000	\$15,988,894
2011			\$46,253,000	\$46,253,000	\$14,860,377
2012			\$44,653,000	\$44,653,000	\$13,793,969
2013			\$43,053,000	\$43,053,000	\$12,797,543
2014			\$31,453,000	\$31,453,000	\$8,982,815
	\$0	\$0	\$2,056,170,000	\$2,056,170,000	\$1,274,570,962
	=====	=====	=====	=====	=====

August 1985

TVA NUCLEAR POWER AND THE FEDERAL PAY CAP

Management of nuclear power projects has become one of the most critical issues TVA has ever faced. The construction and operation of these power plants is essential to TVA's ability to continue meeting the demand for electricity at reasonable cost. But they cannot fulfill that role unless TVA can establish and justify public confidence that they are being operated safely.

This is a cause that can be lost for the want of a horseshoe nail--TVA's inability to pay competitive salaries to recruit and retain key managers in the power program. From a practical business standpoint, the savings to TVA and to consumers from the present salary limits on these positions are almost insignificant compared to the prospective losses if these plants cannot be managed efficiently and safely.

Because of its lower maximum salary levels, TVA's nuclear power program has become a training ground for other power systems with nuclear plants. In recent years six top TVA nuclear managers have left to head utility companies' nuclear programs or run nuclear plants elsewhere. In addition, TVA has lost a significant number of its most able middle managers to other power systems, people who otherwise would now be filling the gaps left by the departed top managers. (More detailed information is presented at the end of this paper.)

Competitive salary is clearly a key to providing the management capability to complete and operate TVA nuclear plants. Currently Browns Ferry Nuclear Plant is shut down both for physical corrections and to improve management and operating procedures. The Sequoyah Nuclear Plant is in a temporary shutdown status, and while it has been graded above average in regulatory performance, it too has experienced some operational and management deficiencies of concern to TVA. Watts Bar Nuclear Plant, although close to operating readiness, is "on hold" while safety concerns are being resolved.

Not a "Panacea" By Itself. Obviously, solving the salary problem by itself would not be a panacea for the nuclear program. As outlined later in this paper, TVA is working diligently on a long list of measures to correct other problems with the management, procedures, and equipment at its nuclear power plants. These include measures to address issues identified by the Nuclear Regulatory Commission (NRC). Each of these efforts helps to move the nuclear program one step closer to a level that can be acceptable to the TVA Board of Directors, the NRC, and the public.

However, the success of this costly and time-consuming effort depends on effective management. It can be stymied by the inability to attract the most qualified people available to fill key management positions, because TVA cannot pay competitive salaries.

In a recent report outlining performance deficiencies at TVA nuclear facilities, the NRC executive director for operations referred to the salary problem. Noting that TVA had increased compensation for its reactor operators and senior reactor operators, the report said:

"The limit on Federal salaries continues to limit TVA's ability to competitively recruit and retain both middle and upper level managers for key positions. While some efforts appear to have been made to improve TVA's lower level management recruitment and compensation, we believe there is a significant lack of nuclear operations experienced key managers, and this deficiency could be a prime cause for the problems being encountered throughout the TVA organization."

Why the Problem Exists. The salary restriction is a problem TVA cannot solve by itself. The TVA Act provides that no employee can earn more than members of the Board of Directors. The Board members' salary level in turn is set by Congress as part of the overall salary structure for executives in other Federal agencies. (TVA Board members cannot set their own salaries, and are not proposing to change that arrangement.)

Any exception to this salary limit must be approved by Congress. Currently, this means no TVA manager can be paid more than \$72,300. A salary survey conducted by an outside organization with experience in the utility industry shows that for key power and engineering positions, the typical salary levels among neighboring utility companies range from several thousand dollars above the TVA limit to well over \$100,000 for a few top positions.

Proposed Solution. TVA is proposing that Congress allow the TVA Board to pay only selected power and engineering management positions "at salary levels paid to comparable employees in major private electric utility operations located in the southern United States," even where that would exceed the salary level for TVA Board members.

To provide objective outside review, proposed salary levels would be submitted to the Secretary of Labor in Washington. There the TVA proposal would be compared with a recent survey of similar salaries paid by other Southern electric utilities. If the Labor Department did not agree with TVA's proposal, the Secretary then would determine a proper salary range under this comparable pay standard, and TVA would apply salaries within that range.

These salary levels would be public information, available to Congress, news media, and the public.

This special exemption would not apply to TVA managers in general administrative positions, managers in nonpower programs, or to the Board members themselves. The additional compensation would come from power system revenues, not from Federal tax funds.

Based on a survey of comparable management salary levels, it appears that perhaps three dozen or so TVA positions would fall under this exemption, representing a total increase in payroll cost of less than \$1 million per year. This would be a small fraction of the benefits ratepayers would reap from efficient operations of TVA's nuclear plants.

As an interim, short-term measure, there are some fringe benefits TVA could provide to improve incentives for these key management positions--in such areas as deferred compensation and other retirement benefits, automobiles, bonus payments similar to those used in other Federal agencies, and insurance. These kinds of executive benefits are prevailing in the utility industry and can be made available under present law.

However, these interim measures cannot solve TVA's long-term problems in recruiting and keeping managers for key positions. They can only serve to ameliorate the problem while Congress is considering a permanent solution.

Other Outside Comments. TVA's problem in recruiting and holding managers in this field has been recognized repeatedly by outside organizations reviewing TVA's nuclear power program.

The Senate Committee on Environment and Public Works, following TVA oversight hearings in 1981, reported that "TVA is experiencing high staff turnover and faces serious problems in staff recruitment which adversely affect efficiency and productivity. To keep power rates as low as possible, TVA must retain its best power system professionals and executives."

In 1983 the President's Private Sector Survey on Cost Control in the Federal government (the Grace Commission) reported: "The investor-owned utilities find it less expensive to recruit trained, experienced TVA

managers than to train new recruits in-house. On the other hand, the size and complexity of TVA management positions, as well as the long learning curve required to handle these positions, often make it impractical for TVA to recruit executives from outside the TVA system. The problem is compounded by TVA's inability to offer a competitive salary."

Both reports recommended measures to provide more competitive compensation for these TVA positions.

Background. For four decades TVA earned an international reputation for building and operating power plants efficiently, including both the hydroelectric projects of the 1930s and '40s, and the coal-burning projects of the '50s and '60s. Its engineering and construction organization designed and built its own projects, generally on schedule and within budget. Its power system consistently showed high efficiency and low costs in all phases of operation. TVA became the largest power producer in the United States, with rates as much as 50 percent below national averages.

Today the TVA power system continues to show outstanding performance in many respects. Under the management of Hugh Parris it has gained a list of impressive accomplishments in recent years in operating efficiency, cost reduction, and financial stability.

TVA hydroelectric plants still supply some of the most economical power in the country, although that output can fill only about one-fifth of the TVA region's power needs today.

TVA coal-burning plants also rank low in cost and high in efficiency compared to similar plants elsewhere, after extensive modernization work in recent years to improve their reliability and reduce air pollution. For two years in a row TVA's Bull Run Plant has had the best heat rate in the country among major coal-fired power plants (heat rate is the basic measure of efficiency in converting fuel to electricity). And TVA coal-burning plants as a group rank among the best systems nationally in terms of heat rate.

However, nuclear power has been a different story, for TVA and other power producers. The original promise of nuclear power was in its low fuel costs and in its clean operation compared to the problems of controlling tons of pollution emitted by conventional power plants. But those advantages have been largely offset by the massive complexity and cost of meeting necessary safety standards in the construction and operation of nuclear power plants.

Using Existing Leadership More Effectively. While most of the problems at TVA nuclear plants are typical of nuclear power plants generally, both the TVA Board of Directors and the Nuclear Regulatory Commission have been dissatisfied with TVA's slow progress in resolving these problems and improving performance. TVA already has taken several basic steps to make more effective use of the nuclear management talent now available in the organization.

Last year it combined the TVA Office of Power, which operates the system, with the Offices of Engineering and Construction, which design

and build TVA power plants. This action was taken to resolve problems in coordination that had been identified as one reason for TVA's difficulties.

Engineering staffs from those two organizations that were involved in construction and modifications at specific nuclear plants were moved from TVA's Knoxville and Chattanooga offices to those plant sites, again to further improve coordination.

Recently TVA assigned responsibility for all nuclear-related activities to a single manager, separating leadership of this effort from other power operating, engineering and construction activities. TVA has assigned its strongest management talent to this effort.

The manager assigned to head nuclear activities is Hugh Parris, who has managed notable achievements in power system efficiency as head of TVA's overall power organization. Assisting Mr. Parris is William Cottle, most recently Site Director for Watts Bar Nuclear Plant and previously an NRC staff member. (However, this move leaves Watts Bar without a Site Director, a critical position to fill before that plant begins operation.)

While these actions have provided a more effective focus of available leadership on this critical need, they do not solve TVA's problem of building more management talent while shackled with uncompetitive pay limits.

TVA's Nuclear Improvement Program. Because of excessive safety violations at Browns Ferry Nuclear Plant, largely involving failures to follow proper procedures, TVA in 1984 developed a Regulatory Performance

Improvement Program to focus increased management and employee attention on identifying and correcting problems at this plant.

The Browns Ferry plant, with a generating capacity of nearly 3,500,000 kilowatts in three generating units, is one of the country's largest nuclear power installations. It was planned in the 1960's as the first of a new generation of nuclear plants that would generate power on a comparable scale with the largest conventional power plants. Construction started in 1966 and power generation began in 1974. This plant was built and has operated through a period of continual changes in nuclear plant design and operating requirements, involving millions of dollars and millions of manhours for large-scale revisions in plant systems and operating procedures.

The Browns Ferry improvement effort includes a wholesale analysis and revision of hundreds of operating and maintenance procedures, which had been amended in some cases until they were unclear or poorly organized. Outside consultants have been hired to help develop retraining activities to ensure that plant managers and employees follow procedures properly.

To allow Browns Ferry to give first priority to this extensive improvement effort, rather than the responsibilities of daily operation, in March 1985 the TVA Board of Directors and power system management made an unprecedented decision--to leave the plant out of service until they are satisfied that it is ready to operate safely and efficiently.

This left the two-unit Sequoyah Nuclear Plant as TVA's only operating nuclear facility; it currently is shut down until environmental qualification can be documented satisfactorily.

TVA's third nuclear plant, Watts Bar, has reached a stage when fuel loading normally would begin for the first generating unit (it is a two-unit project). However, TVA has decided not to request an operating license for Watts Bar unit 1 until various safety questions are resolved. This effort focuses particularly on questions and concerns being raised by employees.

It is not unusual for questions of this kind to be raised when construction is being completed at any nuclear power project, and construction forces are to be phased out.

However, because of the number of concerns raised at Watts Bar and some employees' concern about confidentiality, TVA has hired Quality Technology Corporation (QTC) to conduct confidential interviews with all 4,000 Watts Bar employees to elicit safety concerns. These are being systematically investigated by QTC and by TVA's internal, independent Nuclear Safety Review Staff.

QTC also has invited employees at other TVA nuclear facilities to express any safety concerns, and has provided a confidential toll-free line for their use. None of the employees who are interviewed by or contact QTC with safety issues are identified to TVA without their consent.

A fourth TVA nuclear plant, Bellefonte, is still under construction. The additional power it will supply is not expected to be needed until the 1990's.

Expanded Training Programs. In the early 1970's when TVA set up an extensive training program for licensed unit operators to staff the control rooms at nuclear plants, it recruited high school and technical school graduates, rather than college graduates with engineering degrees. Most unit operators in power plants traditionally were skilled craft employees with technical training.

As a result, TVA nuclear plants have had engineering staff members with training in the way systems were designed and installed, and control room personnel with hands-on experience as unit operators. But it has become increasingly desirable to have people who combine both types of background, to form a pool of potential nuclear managers with this combination of experience and skills who can supervise the day-to-day operations of these plants.

NRC called attention to this problem, and TVA has responded by encouraging both groups to gain additional training. Employees with engineering degrees have been encouraged to enter the training program to become licensed nuclear unit operators, and TVA has arranged to make engineering courses available to present unit operators through night classes at nearby colleges. This is another way TVA is trying to minimize future shortages of trained nuclear managers.

Current Priorities. TVA has established priorities in its nuclear program, designed to concentrate its nuclear resources and focus its capabilities where they are needed first and most:

1. To achieve exemplary performance at Sequoyah Nuclear Plant, as soon as it is returned to service.
2. To continue preparations to permit resumption of operation of one Browns Ferry unit under proper safeguards.
3. To pursue licensing of Watts Bar Nuclear Plant unit 1 on an expeditious basis, but with thorough attention to safety concerns. Construction of the second Watts Bar unit will continue, at a level that can be carried out under effective management.
4. Continue construction of Bellefonte Nuclear Plant with activities at a reduced level that is geared to the prospective need for that additional power.

The Place of Nuclear Power in the TVA System. If TVA had to shut down its nuclear power program, that would create serious difficulties for the power system, with heavy impacts on power consumers.

A breakdown of the 114 billion kilowatthours of net power generation on the TVA system in 1984 (in a very simplified form) shows how nuclear power normally fits into the picture.

	<u>Net Generation</u> <u>(million KWH)</u>	<u>Average Fuel Cost</u> <u>\$/million KWH*</u>
Hydroelectric	19,643	0
Nuclear	24,835	\$ 6,543
Coal	69,144	\$17,343
Standby peaking turbines	45	\$72,223

*The TVA system generates a million kilowatthours about every 5 minutes, on the average.

TVA's Browns Ferry and Sequoyah Nuclear Plants (and the nearly completed Watts Bar nuclear project) have an important place in the system. As the demand for electricity fluctuates hour by hour, the TVA system uses the most economical combination of power sources available to

meet a given level of power demand. More expensive sources are left in reserve until they are needed to meet higher demands--or to replace lower-cost sources that are not available.

Nuclear plants have high fixed costs, including investment costs and other expenses. While efforts are being made to reduce operating and maintenance costs, most of these costs continue whether a plant is running or waiting ready to operate as needed. Since nuclear plants have an advantage in fuel costs, TVA generally operates available nuclear units at full load around the clock to hold down costs and electric rates.

Under normal conditions, most of TVA's power supply comes from available hydroelectric and nuclear generation and from the most efficient and economical coal-burning plants on the system. If the nuclear power supply is reduced, it must be made up from higher-cost sources--other coal-fired units, standby peaking turbines, or power purchases from others at various cost levels.

The effect on costs can add up to large dollar totals, because of the differences in fuel costs and the large amounts of power produced at the nuclear plants.

Without nuclear power, TVA could still meet the region's power needs during periods of moderate demand, but it could not be assured of maintaining reliable power supplies at times of peak demands. And it could not operate its system in the most efficient and economical way.

The present electric rates and financial structure of the TVA power system are based on these nuclear plants being able to recover their original costs through the sale of the electricity they produce over a

long period of years. If that were not going to be the case, this financial pattern would have to be changed radically, and consumers would bear the cost.

These are the critical incentives for correcting the problems that have arisen in TVA's nuclear program and overcoming the obstacles to safe and efficient operation of nuclear plants--including the obstacle of being unable to pay competitive salaries to recruit and keep competent top managers.

0866T

Top-Level Managers in TVA Nuclear Program Who Have Left Since
1980 for Similar Positions With Privately Owned Utilities

<u>TVA Position</u>	<u>Company</u>
Director of Nuclear Power	Pennsylvania Power & Light
Director of Nuclear Power	Consultant with Mississippi Power & Light
Assistant Director of Nuclear Power	Houston Power & Light
Manager of Technical Support	Boston Edison
Plant Site Director	Arkansas Power & Light
Plant Site Director	Kansas Gas and Electric

Section 3 of TVA Act

"...no regular officer or employee of the Corporation shall receive a salary in excess of that received by the members of the Board."

Current Board Salaries:

Chairman:	\$73,600
Members:	\$72,300

Key Nuclear Personnel Who Have Left TVA Since 1982:

Mid- and Upper-level Managers (8 at assistant plant superintendent level or above)

9	- Jobs with other utilities
4	- Jobs as nuclear industry consultants
2	- Jobs with other Federal agencies
<u>13</u>	- Retired and other
28	

Operations Management

20	- Jobs as nuclear industry consultants
2	- Jobs with other utilities
1	- Job with other Federal agency
<u>6</u>	- Retired and other
29	

0866T

Tennessee Valley Authority

REVIEW OF COMPENSATION LEVELS

August 1985



Organization Resources
Counselors, Inc.[®]

Tennessee Valley Authority

REVIEW OF COMPENSATION LEVELS

August 1985



Organization Resources
Counselors, Inc.

Rockefeller Center
1211 Avenue of the Americas
New York, New York 10036

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This report presents the results of a survey of compensation levels and related issues conducted by Organization Resources Counselors, Inc. (ORC) for the Tennessee Valley Authority (TVA) in August 1985. The study was carried out under the direction of W. David Wessinger, a vice president of ORC.

OBJECTIVES OF THE STUDY

The objective of the study was to compare TVA compensation levels for 26 jobs with the compensation, including any benefits or perquisites unique to nuclear jobs, paid by other selected employers. To accomplish this objective ORC collected data on:

- Compensation levels in a seven-company group of utilities identified by TVA;
- Compensation levels in the 15 largest utilities that operate both fossil and nuclear plants; and
- Compensation levels in five major architectural and engineering firms that carry out nuclear plant design and construction.

COMPARISON OF SALARY LEVELS

Methodology

ORC first obtained salary data from the seven utility companies identified by TVA. On July 25, 1985, after contacting the companies to obtain their agreement to participate, ORC sent them summaries of the 26 job descriptions and TVA organization charts. This step was required in order to provide a common basis for carrying out job matches by telephone and to give the participants some preparation time. From July 29 to August 2,

ORC talked at length with each company to ensure good job matches and to collect the survey data.

In the seven-company group, ORC was able to find good matches for 23 of the 26 jobs requested. No matches were found for two jobs: Director, Division of Energy Demonstrations and Technology and Director, Division of Operations Support. Although one company was able to match Manager, Power and Engineering (Supply and Use), ORC deemed that insufficient data, and this job is not included in the report.

From available data ORC then compiled salaries for ten of the TVA jobs in the 15 largest utilities that operate both fossil and nuclear plants. In ORC's opinion, these 15 large companies constitute a more appropriate comparison market for TVA than does the seven-company group. The latter includes four companies which are subsidiaries or operating units of larger companies. The average revenues of the seven companies are \$2.1 billion, with two having revenues of less than \$1 billion, compared to revenues of \$4.5 billion for TVA. The average operating revenues of the 15-company group are \$4.1 billion. Average assets of the seven-company group are \$5.3 billion compared to more than \$20 billion for TVA.

ORC contacted eight architectural and engineering firms to determine whether they were able to match the three TVA jobs requested: Project Manager, General Construction Superintendent, and Construction Engineer. Five companies were able to match to these jobs and, in addition, two companies were able to match

Exhibit 1
SALARIES BY JOB FROM THREE SURVEYS
COMPARED TO TVA SALARIES

Job	Average Base Salary				Difference,	
	Market			TVA	7-Company Market/TVA	Percent †
	7-Company	15-Company	A&E Companies		Dollar	
Site Director (Nuclear)	\$ 87,774	\$ 82,809	..	\$70,200	\$ (17,574)	(25)%
Plant Manager (Nuclear)	80,169	..	..	67,600	(12,569)	(19)
Power Plant Superintendent	62,175	..	..	65,920	3,745	+6
Head, Group (Operations and Engineering)	61,111	65,583	..	56,005	(5,106)	(9)
Assistant Head, Group	56,385	..	..	54,722	(1,663)	(3)
Shift Engineer	47,095	49,808	..	47,226	131	..
Assistant Shift Engineer	41,728	42,703	..	39,713	(2,015)	(5)
Manager of Construction	89,753	..	..	70,500	(19,253)	(27)
Project Manager	60,835	..	\$73,566	65,920	5,085	+8
General Construction Superintendent	67,930	..	71,149	56,903	(11,027)	(19)
Construction Engineer	51,289	..	59,493	55,431	4,142	+7
Manager, Office of Engineering	103,912	140,175	..	70,500	(33,412)	(47)
Director, Division of Engineering Projects	66,040	88,278	..	70,200	4,160	+6
Director, Division of Engineering Projects (Nuclear)	79,140	..	..	70,200	(8,940)	(13)
Director, Division of Engineering and Technical Services	68,172	..	..	70,200	2,028	+3
OEDC, Project Manager	81,746	80,743	76,700	70,200	(11,546)	(14)
Manager, Energy Use	95,058	..	..	70,500	(24,558)	(35)
Director of Energy Use and Distributor Relations	64,491	94,290	..	70,200	5,709	+8
Director of Conservation and Energy Management	76,152	..	..	70,200	(5,952)	(8)
Manager of Operations	115,397	..	..	70,500	(44,897)	(64)
Director of Fossil and Hydro Power	90,791	..	..	70,200	(20,591)	(29)
Plant Manager (Fossil)	62,098	67,619	..	63,860	1,762	+3
Director, Division of Power Systems Operations	82,843	101,159	..	70,200	(12,643)	(18)

†Percent of TVA salary.

the job OEDC Project Manager. Data on these four jobs are included in this report.

Findings

Base Salaries. Exhibit 1 (facing) presents a summary of the survey findings for each of the three groups surveyed.* The dollar and percent differences between TVA base salaries and base salaries of the seven-company group are also shown.

The TVA salaries are below salaries in the seven-company group for 16 of the 23 jobs. The shortfall ranges from a low of 5 percent to a high of 64 percent. In six jobs the TVA rates are 25 percent or more below the market. For the eight jobs for which TVA base rates exceed the seven-company market, TVA is high by less than 1 percent to 8 percent.

It is ORC's opinion that pay rates which vary from the market by 10 percent or more are likely to be problem jobs. In this instance, 11 of the jobs at TVA are low by 10 percent or more relative to the market. No job is as much as 10 percent above the market.

Exhibit 1 also shows the salaries for 10 jobs for the 15-company group. In almost every case, these large companies pay more than do those in the seven-company group. It has been ORC's consistent observation that large companies pay more than small companies and that the pay differential between large and small companies increases directly with the level of the jobs.

*Detailed survey results are presented in the appendices.



The data from the four jobs matched by the architectural and engineering firms is also included in Exhibit 1. In only one case are their salaries below the seven-company group. In all cases their salaries exceed TVA's.

Benefits, Perquisites, and Premiums. Stockholder-owned utilities in general tend to be well above average in the employer paid benefits provided. However, in most instances these benefits are the same for all employees. No member of the seven-company group reported any benefits, perquisites, or special pay unique to nuclear jobs other than nuclear license premiums (see Appendix D). Nuclear premiums are included in the base for pension determination in 20 companies and for life insurance coverage in 12 companies.

Forty of the 47 companies with nuclear power plants pay overtime to exempt employees under certain specified conditions. The rates paid range from straight time to premium rates equal to the overtime rates of those supervised. Some companies have a ceiling on the grade level authorized to receive overtime payments; other companies impose a dollar per hour ceiling. In 16 companies, the nuclear premium is included in the base for determining overtime payments.

Although none of the seven-company group reported a retention bonus, this benefit unique to nuclear jobs is offered by some utilities. It typically takes the form of an accrual over a period of up to three years of amounts from \$12,000 to

\$15,000. If the employee leaves the company prior to the scheduled payment date, the accrued retention bonus is forfeited.

At the officer level, and frequently somewhat lower in the organization (especially at the plant manager level), it is fairly common practice to provide company cars. Again, however, this is a common benefit, not one provided only to nuclear personnel. The value of a company car to an individual employee depends on a number of factors, including the type of car, whether personal use is authorized, and the individual's tax situation. On average, however, a car is generally considered to have a value of about \$6,000 per year to the recipient.

In one area, TVA is a pay leader by a modest amount. The average premium for an SRO license in the stockholder-owned utilities is approximately \$6,000 per year, compared to the TVA premium of \$7,000 per year.

CONCLUSIONS

The data collected and analyzed in connection with this report lead to the following conclusions:

- Continuation of senior manager pay rates that are substantially below the rates paid for similar jobs elsewhere will result in the loss of personnel critical to the safe and successful operation of TVA's nuclear facilities.
- The inadequate salaries resulting from the salary cap imposed by the TVA enabling legislation precludes filling senior management jobs in the nuclear area from outside the TVA.

Appendices

A-1

Appendix A

SEVEN-COMPANY MARKET

American Electric Power Service Corporation

Arkansas Power and Light Company

Carolina Power and Light Company

Duke Power Company

Florida Power and Light Company

Georgia Power and Light Company

Mississippi Power and Light Company

Appendix B
FIFTEEN-COMPANY MARKET

American Electric Power Service Corporation
Commonwealth Edison Company
Consolidated Edison Company of New York
Detroit Edison Company
Duke Power Company
Florida Power & Light Company
Georgia Power Company
Houston Lighting & Power Company
Niagara Mohawk Power Corporation
Pacific Gas & Electric Company
Philadelphia Electric Company
Public Service Electric & Gas Company
Southern California Edison Company
Texas Utilities Services, Inc.
Virginia Electric & Power Company



Appendix C

ARCHITECTURAL ENGINEERING COMPANIES

Bechtel Power Corporation

Burns & Roe, Inc.

Combustion Engineering, Inc.

Ebasco Services, Inc.

United Engineers & Constructors



Appendix D
7-COMPANY MARKET SURVEY RESULTS BY JOB

Job	Number of		Weighted Average Base Salary	Number of		Average Bonus Received	Average Salary Range			Average Nuclear Base Plus Premium
	Companies Matching	Incumbents		Companies Paying a Bonus	Incumbents Receiving a Bonus		Minimum	Midpoint	Maximum	
Site Director (Nuclear)	2	2	\$ 87,774	0	0	..	\$ 69,966	\$ 85,086	\$100,206	..
Plant Manager (Nuclear)	6	10	80,169	1	1	\$11,800	65,252	81,273	97,294	\$1,560
Power Plant Superintendent (Nuclear)	5	8	62,175	0	0	..	57,304	67,286	77,267	3,060
Head, Group (Operations and Engineering)	7	11	61,111	0	0	..	48,227	59,488	70,749	4,128
Assistant Head, Group	2	3	56,385	0	0	..	43,188	53,487	63,786	5,700
Shift Engineer	7	111	47,095	0	0	..	39,538	48,650	57,742	4,663
Assistant Shift Engineer	6	158	41,728	0	0	..	35,442	43,684	51,925	5,340
Manager of Construction	5	6	89,753	1	1	22,900	72,842	89,861	106,879	..
Project Manager	4	12	60,835	0	0	..	57,236	71,084	84,933	..
General Construction Superintendent	3	5	67,930	0	0	..	53,140	65,978	78,816	..
Construction Engineer	4	5	51,289	0	0	..	45,561	55,508	65,454	8,088
Manager, Office of Engineering	3	3	103,912	0	0	..	94,952	118,508	142,064	..
Director, Division of Engineering	3	3	66,040	0	0	..	55,425	68,698	81,970	..
Projects	3	5	79,140	0	0	..	60,205	75,266	90,327	..
Projects (Nuclear)	2	2	68,172	0	0	..	59,508	74,385	89,262	..
Director, Division of Engineering and Technical Services	5	6	81,746	1	1	12,569	66,339	82,617	98,494	..
OECD, Project Manager	3	2	95,058	0	0	..	86,245	110,523	132,801	..
Manager, Energy Use	4	4	64,491	0	0	..	51,532	62,964	74,396	..
Director of Energy Use and Distributor Relations	3	3	76,152	0	0	..	62,624	78,280	93,936	..
Director of Conservation and Energy Management	5	5	115,397	0	0	..	100,378	124,440	148,502	..
Manager of Operations Support	6	6	90,791	1	1	22,300	74,869	92,707	110,344	..
Director of Fossil and Hydro Power	7	36	62,098	1	3	4,773	49,809	64,196	78,583	..
Plant Manager (Fossil)	4	4	82,663	0	0	..	65,553	80,756	95,958	..
Director, Division of Power Systems Operations										

One company.

Note: The Average Nuclear Premium reported is a simple average of nuclear premiums paid by those companies paying a premium. They are shown here in annualized rates, though in practice they are paid out monthly.
Nuclear Base Plus Premiums (the last column of figures) equals the average base salary (weighted by the number of incumbents) plus premiums received.

Appendix E
15-COMPANY MARKET SURVEY RESULTS BY JOB

Job	Number of		Weighted Average Base Salary	Average Salary Range			Average Bonus Received	Weighted Average Nuclear Premium	Nuclear Base Plus Premium
	Companies Matching	Incumbents		Minimum	Midpoint	Maximum			
Plant Manager (Nuclear)	14	21	\$ 82,809	\$ 66,652	\$ 83,356	\$ 99,220	..	\$3,732	\$86,769
Head, Group (Operations and Engineering)	14	22	65,583	51,908	64,615	76,901	..	4,872	70,752
Shift Engineer	14	181	49,808	41,201	50,253	58,440	..	5,368	55,526
Assistant Shift Engineer	11	213	42,703	36,005	45,581	51,437	..	5,328	48,356
Manager, Office of Engineering	2	2	140,175	100,366	125,451	150,536	..	..	..
Director, Division of Engineering Projects	12	16	88,278	70,970	88,661	107,223	..	..	..
OEDC, Project Manager	10	13	80,743	65,265	82,010	98,844	\$ 4,2731	..	..
Director of Energy Use and Distributor Relations	14	19	94,290	68,143	85,911	103,679	10,415	..	..
Plant Manager (Fossil)	13	105	67,619	53,573	66,634	80,032	3,207	..	..
Director, Division of Power Systems Operations	12	12	101,159	74,756	95,262	115,780	6,271	..	..

†One company.

Appendix F
ARCHITECTURE AND ENGINEERING COMPANY MARKET SURVEY RESULTS BY JOB

Job	Number of Companies Reporting	Average Base Salary†	Average Salary Range			Bonus Reported
			Minimum	Midpoint	Maximum	
Project Manager	3	\$73,566	\$57,205	\$74,397	\$91,588	..
General Construction Superintendent	4	71,149	50,364	64,556	78,747	..
Construction Engineer	3	59,493	45,415	58,674	71,932	..
OEDC, Project Manager	2	76,700	56,098	73,987	91,876	10% of base [1 company]

†Simple average of companies reporting.



Organization Resources
Counselors, Inc.

Appendix G

ABOUT ORC

Organization Resources Counselors, Inc. is a consulting firm offering professional assistance in the areas of human resources and management organization. ORC's purpose is to aid clients in developing policies and practices that permit and encourage employees to work more effectively within their organizations. ORC's main office is in New York City; other offices are located in Washington, D.C.; Los Angeles; Montreal and Toronto, Canada; London, England; and Paris, France.

The firm traces its roots back to 1926, when John D. Rockefeller, Jr. established a nonprofit research and educational organization called Industrial Relations Counselors, Inc. (IRC). In 1953, a separate business corporation was established to provide professional consulting services in the areas of management and industrial relations. This consulting firm, Industrial Relations Counselors Services, Inc. was built around many of the senior staff who had previously served with IRC. In 1969, the name of this firm was changed to Organization Resources Counselors, Inc. (ORC) to reflect its expanded range of services and interests.

ORC's approach to counseling is based on three fundamental beliefs:

- Human problems cannot be solved by formula; each requires a unique solution built on imaginative application of sound theory and practical experience. Such a solution must take into account not only conditions specific to the organization

itself, but also such external considerations as trends in the economy, public opinion, legislative action and judicial decisions.

- A complete counseling service must produce effective action, not merely correct diagnosis. ORC services do not end with a report. The firm views its counseling role as including not only objective diagnoses and formulation of workable recommendations, but also keeping in touch with the client's progress and assisting client personnel in establishing and maintaining programs that meet the client organization's needs.
- Long-term success can be attained only by the efforts of the client organization's own management and staff. ORC is effective in bringing about remedial action in client organizations because each project is planned as a cooperative effort. Client personnel at all levels contribute actively to the design of the recommended program, and thus are prepared and motivated to carry it out successfully.

Working under this philosophy for the past 30 years, ORC has carried out assignments for many of the nation's 500 largest corporations, and for numerous business organizations in Canada and overseas. Many of these clients have maintained an ongoing relationship with the firm and its professional staff for a number of years.

Among the areas of ORC expertise are: organization structure and management studies, including employee relations audits; employee selection programs; personnel training and development programs; employee attitude surveys; equal employment opportunity; occupational safety and health; compensation surveys; wage and salary programs; executive compensation and benefits plans; analysis of benefit plans; employer/employee communications; U.S. and international labor relations; personnel policies and compensation programs for national and U.S. or international expatriate employees.

A major focus of ORC's consulting practice is in the area of compensation. Representative projects have included analytical reviews of compensation policies, practices, and techniques; development of several types of job evaluation and performance appraisal plans; development of executive compensation programs; advice and counsel on special compensation problems, including vulnerability to charges of pay discrimination; development of new wage and salary structures; and general assistance to clients interested in improving the effectiveness of their compensation programs.

ORC's compensation practice also includes both continuing and custom-designed compensation surveys. The largest repetitive survey is the Salary Information Retrieval System (SIRS), a fully computerized semiannual survey covering about one million employees from more than 500 major companies.

ORC also serves as a consultant to the Edison Electric Institute, an association of shareholder-owned utilities. In this role ORC has, for ten years, conducted salary surveys among the EEI membership. The surveys conducted are:

Management, Administration, and
Professional Survey

Nuclear Survey

Nonexempt and Physical Rate Survey

Benefits Survey

ORC also has extensive experience in consulting assignments with the EEI member companies.

Appendix H

BIOGRAPHY

W. DAVID WESSINGER is a vice president of ORC responsible for directing ORC's domestic compensation services, which provide consulting on all aspects of compensation, such as wage and salary programs, job evaluation systems, and management incentive programs. He also directs all of ORC's extensive survey activities, including the Salary Information Retrieval System (SIRS), which by computer compares and analyzes the salaries of some one million employees of more than 500 employers nationwide and a series of four annual surveys for the stockholder-owned utilities who are members of the Edison Electric Institute. In addition, he works with corporations to ensure that their pay practices comply with EEO requirements.

On recent consulting assignments, Mr. Wessinger has been involved in compensation studies for several major utilities. Many of these studies directly involve consulting assignments relating to pay levels in nuclear facilities.

Prior to joining ORC in 1968, Mr. Wessinger spent 25 years in the United States Navy. He served as Director of Entitlements in the Bureau of Naval Personnel and as the Secretary of the Navy's representative on task forces of military and civilian personnel examining pay, benefits, and equal



opportunity issues. He also served as a Commander of a division of four nuclear submarines and as Assistant Chief of Staff for Personnel on the staff of the Commander, Submarine Force Pacific Fleet.

Mr. Wessinger has a bachelor's degree in business administration from George Washington University and a master's degree in management from the U.S. Navy Post Graduate School. He is a member of the Institute of Management Consultants and is a Certified Management Consultant. He is a member of the Panel of Arbitrators of the American Arbitration Association. He is a guest lecturer at the Cornell School of Hotel Management and for the ACA.



TENNESSEE VALLEY AUTHORITY OVERSIGHT

TUESDAY, JULY 16, 1985

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
SUBCOMMITTEE ON REGIONAL AND COMMUNITY DEVELOPMENT,
Washington, DC.

The subcommittee met at 10 a.m., in room SD-406, Dirksen Senate Office Building, Hon. Gordon J. Humphrey (chairman of the subcommittee), presiding.

Present: Senators Humphrey, Abdnor, Lautenberg, and Burdick.

OPENING STATEMENT OF HON. GORDON J. HUMPHREY, U.S. SENATOR FROM THE STATE OF NEW HAMPSHIRE

Senator HUMPHREY. Good morning.

This is the second hearing of the Senate Subcommittee on Regional and Community Development focusing on TVA. We have another hearing scheduled on July 30.

As I stated yesterday, this is meant to be an on going effort. There will be more hearings beyond these three. As a matter of fact, while there are yet no formal plans, I am today proposing to conduct, in conjunction with Members of Congress from the TVA region, field hearings later this year in the TVA region to permit citizens and citizen groups and public officials to express their point of view. We have heard from the official representatives of the TVA. I think it would be well that we heard not only from them but from those whom they serve in the TVA region.

Today's hearing will give an opportunity to Members of Congress from the TVA region to express their points of view. I welcome their participation in today's hearings as well as yesterday's and in all future hearings, whether members of this subcommittee or this house or not, because if ultimately we are to make structural changes that benefit the constituents and the consumers of TVA, then we cannot do so without the help of Members of Congress from that region. So we start off soliciting their participation, their support, and suggestions.

Our first witness this morning is a Senator long connected with TVA and other matters important to his region, Senator John Stennis. Senator Stennis, good morning. We are glad to have you with us.

**STATEMENT OF HON. JOHN STENNIS, U.S. SENATOR FROM THE
STATE OF MISSISSIPPI**

Senator STENNIS. Thank you, Mr. Chairman. I am delighted to be here. I attended the session yesterday and thought it was a splendid hearing. I am kind of an old hand at hearings because of the time I have been here.

I have a prepared statement, Mr. Chairman, and I have in mind to ask permission that we may insert that prepared statement in the record.

Senator HUMPHREY. Of course.

Senator STENNIS. I have thought it over. I think that I might be able to make some contribution with reference to the legislative history, not of TVA entirely but as it has developed while I have been here as a Member of the Senate. It might shed light at least on some of these steps that have been taken.

Mr. Chairman, I don't know exactly how I got on the committee assignment I did when I came. I was in a class of one. I was the only Senator that came in that November election, and I was a member of the minority. Just whatever happened to be left around was what I got.

Mr. Truman was President then. When they took me down to meet him, a former Senator, he said, "I noticed they put you on XYZ committee." I said, "Yes, Mr. President". He said, "Get off of it as soon as you can." You remember how frank he was. Anyway, I landed in a lucky spot. I was made the member called in the rules the ex officio member of the Senate Public Works Committee to the Appropriations Committee, presumably for assignment to that subcommittee of the Appropriations Committee that dealt with matters within the realm of public works.

They put me to work. I was the new man. And they opened up a new America to me. They insisted someone go to a number of these installations that were being put in, and particularly at that time in the West. The first place I went, with the excellent guide and staff member with me, was North Dakota. I was favorably impressed with what I saw there with reference to this project.

Then I went to the Far West and things commenced really unfolding to me. I never had been out on an irrigation project. In New Mexico I saw a small irrigation project. It was fertilizing waterwise a small area of ground there. On it they were growing cotton. And I said how much do you grow per acre? He said two bales. I didn't believe him. It was unbelievable. I was jealous of him, too. We didn't grow but one bale of cotton a day then even in our rich delta land. But that had been lying there all these years. They just put a little water on it. Two bales to the day. That opened my eyes.

I went on from there. I touched some of the highpoints there. I got up into the Hoover Dam country and on up into the far Northwest where I had never been. Those projects, that you doubtless have become familiar with, are a tremendous part of the development of that great area of the country that came from those water projects. They just made an area there a place to live. Agriculturally they made it.

I am from from an agricultural State. I could see these things and realize what was happening, what had been done, and began to see dimly the possibilities of what was coming the Hoover Dam, I have already mentioned that by name. I got on up in the Far West; the irrigation; and back down this way. I mentioned those briefly.

But in that group there was TVA. Well, I live fairly close there, but I never had been to TVA's offices and things like that. I can't recall that I have ever been there, even until now, except one time. But I began to notice the potential there.

The first thing that I recognized was that fertilizer experiment, they called it then, that they were carrying on. I remember vaguely when Woodrow Wilson first advocated, World War I, the building of what has become TVA, and didn't get it finished, of course, but he said the peacetime work of this organization would be carried on through fertilizer experimentations.

I remember what my father said, talking to the man he had working on the farm. He said, "We hear of a new kind of fertilizer and we are going to try it out."

He said:

This we have been using, you just about as well to put out that many sacks of dust here because there is nothing to it. It doesn't sustain anything. The plant food is not there. You can tell in your hand when you feel it.

Well, I have kept up with that ever since. I have asked them at agricultural colleges where I went to college myself and elsewhere where they are supposed to know. They all give it a strong plus for its contribution. Of course, I am proud of that. I learned what nitrate of soda was. We already had it before then, but they even improved that.

I will move on now. During World War II, I was a judge there of a circuit court. We didn't have as much court. I was at home a good deal. A man knocked on my front door one day. It was kind of a habit, that things they didn't understand, they would go see the judge about it.

Anyway, he said:

Judge, I have been talking to a man here that is a traveling salesman. He tells me that there are hundreds and hundreds of people employed up there in Tennessee. They are working for the government, and that is all they know. They don't know what they are doing.

He said, "I am concerned about that."

I said:

Well, you needn't worry about that. It is just possible that that could be true. If not true, he might have been playing a joke on you. But nothing like that is going on.

So he left with some doubtful assurances. Three days later they made the announcement we had dropped what we called then the atomic bomb. The next day the paper said that a great deal of the basic work for this project was done in Tennessee at Oak Ridge. And I think they were making uranium for the bomb at Oak Ridge.

So I put that ASAN argument for this organization: The contribution of weaponry, and I have been in that a lot since, that was No. 1; that showed the capacity was there. But without this backup, this physical backup, an enormous amount of electricity—

by the way, some old fellow said over there on the other side of the State, "I know my lights have been dim here 2, 3 years." He thought that meant they had it turned on. [Laughter.] But when it comes to a real contribution, militarywise, I would put that down as No. 1. Now, there have been others that have come out of there.

I want to repeat now, gentlemen, what I said to the chairman a few minutes ago. I am a strong advocate of this accountability hearing idea. The enormous sum of money we are called on to appropriate now is almost beyond human capacity within the limited time for us and many in the Government to have grasp what it means.

That augments and underscores and makes absolutely necessary, as I see it, to have an accountability hour on TVA if not every year, every other year anyway, to make that responsibility sink in deep. That is no reflection on the ones that have been commissioner. I am amazed at the record these gentlemen have made, as I understand it. None of them have ever been appointed at my suggestion. I have stayed out of that. I was willing for someone else to do it. They have done me no favors. But they have done an excellent job, I think, on a marvelous kind of experiment to start with for our Government, for our system of government, and our Congress.

But the record has been very good, and by and large the personnel that I have come in contact with have been men of unusual capacity. I am not talking about commissioners now. I mean those out there doing the work. Very, very high quality people. Like I say, they haven't done anything for me, but I am proud of their record.

Now, in that connection, I believe in the authorization, way back yonder I was a member of the Armed Services Committee, when we had very little to do with selecting the weaponry that would be built, authorized. I put in an amendment requiring authorization up to the Appropriations Committee; had sole jurisdiction you might say. Whether tanks, guns, ships, whatever it would be, they made this selection. And they did a pretty good job, maybe, but it was the Armed Services Committee's responsibility, as I saw it, and I put that amendment in, expanded it, and it has grown into the law as you know it today.

So I lean that way, towards the accountability hour and responsibility, and to have a committee, a major committee, that is primarily responsible.

The financing system that we have now for TVA, we have a contest on a lot of things just where they needed an extra dynamo, I called them, or had a vacant front there that they hadn't built a dynamo in the dam, it would take a special bill, no one had the authority to buy it, and we would argue about it 2 weeks maybe sometimes in debate. That was when TVA was more of an issue, you know larger than now. But I think we have passed that stage and wouldn't have to go back. We passed that law partly in self-defense. As I said the other day the subcommittee just had too many things coming in every year, commissioners kept too busy on it.

It seems to me, though, that the money part has been worked out pretty well and they are paid up, as they say. People take a good,

hard look at that, I know. But I would say it could be shown that they were able to make it.

Now, I think that we would make a great mistake if we withdrew now. So much good has come from these developments to withdraw in an appreciable way and just take out from whatever those figures are. The \$129 million request has been reduced in the budget figure to only \$38 million, it seems to me like that is a jar there, to have such a high percentage, that the work cannot survive. You are losing men.

I don't go out here defending any individual to keep their job from being legislated away, but you go to hitting them 2,000 at a lick—that is the estimate that is given to me—that much of a reduction would cause an impact of that kind with reference to employment. That, put along with the rest of this problem, we still have the problem, of the job that needs to be done.

So I hope that you won't make that impact so very great in that field. I just think the institution itself is worth so much, it has proven to be worth so much, so that if we should just liquidate it all, we would have to go back and rebuild some kind of a substitute for it.

I don't know now, a lot of that includes some of these several aides, assistants of various kinds in other departments. I don't know what it adds up to. But in going around to these public works enterprises and all, I have come across a world of good that has been done. Some of it may be a little duplication. Some of it may be a forced effort that didn't turn out well. But by and large, there are tremendous changes that are sweeping through the country now in the economy.

My home county in Mississippi used to grow 20,000 or 22,000 or 23,000 bales of cotton per year. Now there is not a single gin in the county. The gin is what separates the seed from the lint. Not a single one. If anyone grows any cotton, he has to go somewhere else to get it ginned. So that is a fine description.

Most of those were little farms that I referred to and not the rich delta land that is so prolific and grows so much. That is just an illustration. I use illustrations I know about because I know what the facts are, and really, all my life I have used illustrations.

So you gather all of this stuff together and make a little contribution toward meeting the deficit problem, but I think it would be a grave error just to liquidate these programs. I think the people understand the quality of leadership too, that's being given by TVA.

I see that my time is about up, Mr. Chairman.

I look with great favor on a continuation of these programs here that TVA is doing. I think other areas that haven't gotten a direct benefit from it are entitled to some consideration and possible benefits. With all the assets that we have, with all the mineral assets, with all the timber assets, with the very grave problem we have with the preservation of our land, that is something that I know something about. I have lived on the land all my life, even though I never made my living making an annual crop off of it.

But all the things that go with our economy and the way of making a living for our almost countless millions of people, we need the things that are constructive. And this I believe is a con-

structive record. I feel that I know that, that it meets the problems. To abolish them or retard them unduly, I never have consciously voted for anything that I didn't believe was needed. But let's not act too fast. Let's be sure that we have covered the ground, that we are making a measurement of our demands.

Now, I have been a member of the Armed Services Committee for a long time, and so forth. I am not pushing this on the grounds that we have to have a strong military defense, although we know we have to have it. That is a part of it. We don't like it. We are not a warlike people, but we have to have it and we can't say we are going to have one just for us and no more. We have to help out those who see things like we do.

But I am not trumpeting here for a military program. I am thinking in terms of people having a way of making a living themselves, and I like to see any agency that can help out a little from the scientific end the so-called little people, to help them in any way to make that living in a community where they already live and many of them already own the piece of land they live on and they have it paid for. They have it paid for. You are liquidating there some of the greatest assets we have. And there is no uncertainty of their being pretty good citizens, pretty good. They have to have, though, a way of make a living.

I mentioned that cotton being a thing of the past. I didn't mean to say it wasn't worthwhile, of course. But there are a number of things in farming now that have gotten to where the prices are intolerable. That is, the cost of raising it is just beyond the capacity, the cost of the machinery, the cost of the high-priced labor that has to go into it preparing it for the market. It is just not enough return for the price you get. Unfortunately, I am afraid that is going to be for a good while.

So, Mr. Chairman, if I may ask consent to put my prepared statement in the record.

Senator HUMPHREY. Without objection.

Senator STENNIS. If I may have the privilege of adding a paragraph or two to that.

Senator HUMPHREY. Certainly.

Senator STENNIS. I am going with you on this thing all the way and be with you when I can. I think you do good. But let's not get in a hurry and try to do too much in one year.

Thank you very much.

Senator HUMPHREY. Very well. Thank you, Senator Stennis. We value your testimony and your advice. Thank you.

Senator STENNIS. Thank you very much.

Senator HUMPHREY. We have a prepared witness list, and proceeding on the basis of that listing, we will ask Senator Sasser to provide us his testimony. Senator Sasser, good morning.

STATEMENT OF HON. JIM SASSER, U.S. SENATOR FROM THE STATE OF TENNESSEE

Senator SASSER. Good morning, Mr. Chairman. It is a pleasure for me to be able to address this committee this morning on the subject of the Tennessee Valley Authority. I have with me, Mr.

Chairman, the statement of former Senator Howard Baker, which I would ask be submitted for the record.

Senator HUMPHREY. Fine. We would be honored to include that in the record. [See p. 477.]

Senator SASSER. Mr. Chairman, I welcome this opportunity to evaluate the contributions the Tennessee Valley Authority has made to the Tennessee Valley and to the economic well-being of the Nation as a whole.

I am no stranger to this subject, Mr. Chairman. As a member of the Subcommittee on Energy and Water Appropriations, I have participated in and chaired numerous oversight hearings on the Tennessee Valley Authority power and nonpower programs over the past 8 years. In addition, at my urging, the General Accounting Office established a branch office in Knoxville which has provided Congress with continuing oversight over the operations of the Tennessee Valley Authority.

On several recent occasions I have been a critic of the Tennessee Valley Authority, I think a constructive critic. Certainly when TVA was announcing double digit rate increases regularly during the late 1970's, I was at the forefront of attempts to increase TVA's accountability and their responsiveness.

In my judgment, we have been successful in those efforts. The record will show that TVA took genuine strides forward in response to investigations which I asked the General Accounting Office to perform and in response to General Accounting Office reports.

Moreover, the period of radical TVA rate increases has abated in recent years. As we heard yesterday, there has been no real increase in electrical rates to ratepayers in the Tennessee Valley area in the past 4 years. TVA's annual average residential power rate is once again the lowest in the country, I am happy to say.

Well, obviously TVA does have problems. It still has problems. The nuclear program continues to demand careful scrutiny. TVA's economic development efforts must continue to be overseen by a vigilant Congress, as it oversees what happens with these appropriated funds.

But I would caution that when we begin talking in terms of structural change, we must be very, very careful indeed. Tampering with legislation that has been productive for over half a century can pose some very real problems.

Now, Mr. Chairman, I would say to you and the distinguished ranking member of this subcommittee that I know from firsthand experience the value of the efforts of the Tennessee Valley Authority. It is my hope that these hearings will concentrate on an objective estimate of that value.

The issue before this committee and before all of us is not an abstract question of ideology. It is a question, frankly, of practical results.

Do the Federal dollars spent on TVA's natural resource and economic development programs pay dividends in the Tennessee Valley Authority and do they pay dividends to the Nation? Do they represent a prudent investment of taxpayers' money?

That is the issue we must address, Mr. Chairman. I believe, and I think a fair examination of the record will confirm, that TVA's re-

gional development programs stand up very well under the only test that really matters, the practical test, the test that measures concrete, positive results for the Tennessee Valley region and for the country.

Now, there is no gainsay in the fact that the extraordinary deficits of the past 5 years have caused all of us to intensify the degree of critical scrutiny we devote to all Federal agencies and to all Federal programs. I share this committee's concern that Federal expenditures must be reduced to the minimum investment, commensurate with maintaining absolutely necessary Federal initiatives.

But I cannot accept the proposition that effective Government programs should suffer radical amputation because they don't fit into the narrow definition of philosophical acceptability that appears to be current in the Office of Management and Budget.

The great majority of TVA programs, I submit, produce tangible benefits. They pay back to the Nation what they take out of the Treasury and then some.

In that regard, let's consider the system of dams, locks, and powerplants built in the TVA region with Federal dollars during TVA's first 25 years. It is a commonly held misconception that TVA's power program is federally subsidized. Nothing could be further from the truth. In 1984, the power consumers and the ratepayers of the Tennessee Valley region put \$113 million back into the Federal Treasury—very nearly the same amount invested by the Government in TVA's regional development programs.

As the TVA Board testified yesterday, that amount represents a \$20 million repayment of the Treasury's investment and \$93 million in interest, interest that has been computed at the current cost of money to the U.S. Treasury and money that the Federal Government will not have to borrow to apply to the deficit this year. These payments have gone on for many years and they will continue for many, many years, with interest.

I think it is important for this committee to recognize that these direct returns to the Treasury are accumulating in addition to the benefits that have been created for 52 years by the power system, the flood system, and the navigation system, and the recreational facilities put in place by TVA.

The economic benefits that have grown out of that infrastructure in terms of increased river commerce and greatly increased economic activity have contributed immensely to the economic vitality of this country in the post-World War II era. It is no wonder that visitors who come to the United States from Third World countries and from developing countries, one of their first requests is to see the Tennessee Valley Authority and what has been done in that valley.

It is my contention, Mr. Chairman, that TVA's regional resource management program returns to the Nation's economy and to its reservoir of knowledge about natural resource management benefits that far exceed the value of TVA's annual appropriation.

Yesterday, the TVA Board offered a number of examples of that return on investment. I would like to dwell on just a few of them.

First, in the area of balancing energy production needs against environmental concerns, TVA has established itself as a recognized standard of judgment, of data, and, I submit, of performance. From

its earliest years, the Tennessee Valley Authority has served as a yardstick utility for this Nation. As a publicly owned power producer, it provided for many decades a benchmark utility rate against which the rates of investor-owned utilities could be measured for fairness and for equity.

Today, TVA is still serving that yardstick function, but this time it is doing it in an area that is even more complex and potentially more controversial than the area of power rates.

Through the last 6 years, the Tennessee Valley Authority has invested \$1 billion in environmental cleanup. I submit, Mr. Chairman, this \$1 billion has come from the ratepayers of the Tennessee Valley investing their money in reducing the sulfur emissions of its coal-fired generating plants by more than 1 million tons per year. In so doing, TVA has demonstrated for this Nation that compliance with air quality laws can be achieved at a reasonable price to power consumers.

That demonstration has established itself as a crucial model during the national acid rain debate. With competing claims of environmentalists and utilities about the costs and consequences of further sulfur control legislation, it is invaluable to have as a standard a utility that has cleaned up its act and knows from first-hand experience how much emission control will cost their ratepayers.

We have TVA's data on that subject. We have a record of the methods and the technologies TVA used to perform the largest sulfur dioxide cleanup in the history of this country; indeed, in the history of the world. We also have TVA's clearly articulated stand on the crucial need for acid rain control.

I submit to the chairman and the distinguished members of this committee that those are national resources. They grow directly out of TVA's commitment to environmental consciousness and out of the pool of environmental expertise that TVA has gathered in its Office of Natural Resources and Economic Development.

To eliminate TVA's involvement in environmental research would deprive this country of necessary information and a unique utility model at a crucial time of decision about our air quality laws to determine if applied technology can indeed work at a reasonable cost.

Something similar, I submit, would happen if we eliminate TVA's involvement in soil erosion control. Since 1973, TVA has worked cooperatively with State governments and with the U.S. Department of Agriculture to combat soil erosion in west Tennessee where erosion rates have reached upward of 20 tons per acre per year in some counties. You have only to fly over the Mississippi River and watch it turn a deep brown as it flows past western Tennessee and carries our valuable topsoil down to the Mississippi Delta, where I am sure Senator Stennis and many of his Mississippi farmers appreciate those efforts, but it is a natural resource nightmare.

The TVA efforts of west Tennessee, one of the worst soil erosion areas in this country, were so successful that the Secretary of Agriculture, Mr. Block, supported this model's expansion into the Nation's only regionwide approach to the soil erosion control problem.

TVA's initiatives have helped promote corrective practices that are reducing erosion by an average of 4 tons per acre per year in the most severely affected areas.

Here again, TVA's work can be a standard. The preventive method now being practiced in the valley can provide a national model at a time when the Department of Agriculture is working out a national soil erosion policy that will be most cost-effective, that will possibly include punitive measures against farmers who cultivate erodable soil.

TVA is providing national leadership in the area of adapting educational resources to the needs of industry and the requirements of the changing job market. The Tupelo model for career education is designed to encourage cooperation between educational institutions and industry in order to assure that schools are providing young people with the skills that will be in demand now and in future years. The model has worked out well. It is now being tried out in Chattanooga, TN.

At a time when rapid structural change in our economy is causing radical dislocation within our work force, probably unparalleled since the industrial revolution struck our shores, programs of this kind are crucial. They ensure that people will have the necessary skill to find jobs, and they help our industries remain competitive in the world marketplace.

Mr. Chairman, I can easily extend this list, but in the interest of time I will not. But I will mention the productive TVA ventures in fertilizer research, in the strip-mine reclamation, in water quality assessment, and a whole range of other initiatives that produced immediate regional benefits and have long-term national application.

Programs of this kind cannot, from any fair perspective, be considered subsidies or parochial expenditures. They are innovative and they are productive. They are national in their positive impact. In many cases they are unique to the United States of America.

Nothing quite like Land Between the Lakes exists in the Eastern half of the United States. Very few research institutes have had the success achieved by TVA's National Fertilizer Research Center in pushing new products into the marketplace.

No other entity, public or private, has entered the field of energy production with so keen a sense for environmental consequences as the Tennessee Valley Authority has shown in recent years.

The loss of these efforts would not be simply a regional loss; it would be national, and I think it is fair to say, after consultation with international representatives, an international loss as well.

The TVA model still serves for developing nations throughout the world as an emblem of the flexibility, the ingenuity, the vision of the American Government and the American people. No simple accounting can measure the value of that legacy to the U.S. international reputation.

Mr. Chairman, I submit we cannot afford to abandon that legacy. As I said at the outset, this issue is not an abstract one. It is not a question of ideology or philosophical purity. It is, quite simply, a question of what works.

Fifty-two years of experience have confirmed that the Tennessee Valley Authority Act works.

So, Mr. Chairman, I submit we should exercise extreme caution before changing the framework of an experiment in Government that has been successful for more than half a century.

Mr. Chairman, I thank you and the distinguished ranking member for allowing me to appear here this morning.

Senator HUMPHREY. Our pleasure, Senator Sasser. Thank you for coming.

Senator LAUTENBERG. Before the Senator leaves, Mr. Chairman, I think certainly, Senator Sasser, your remarks do help clarify the situation as you attempt to show the national and international role that TVA plays. Certainly these are factors we have to consider as we review this authorization process.

Senator HUMPHREY. Thank you, Senator.

Senator SASSER. Thank you very much.

Senator HUMPHREY. Next in order on the agenda is Senator Albert Gore. Good morning, Senator Gore.

Senator GORE. Good morning.

Senator HUMPHREY. As I recall, your statement is fairly lengthy. You may proceed as you wish, but I would point out many of our extremely busy colleagues are already waiting to give their valued testimony, and I will rely upon the courtesy of Members to keep matters moving as well as possible.

STATEMENT OF HON. ALBERT GORE, U.S. SENATOR FROM THE STATE OF TENNESSEE

Senator GORE. Mr. Chairman, I am well aware of the fact that some of our colleagues are waiting. I am going to ask for your consent to put the rather lengthy prepared statement which I have submitted to you in the record. I will make some brief remarks in addition to that statement, but I will keep my remarks short.

I do thank you for the opportunity to testify, Mr. Chairman, and I want to reiterate what I said yesterday about how much those of us in the valley appreciate your willingness to allow us to participate in the hearing and to play a meaningful role and to give you our views.

Because this is an important set of hearings, which I believe will show that the TVA has served as a successful, efficient guidepost for programs which have produced extraordinary national benefits, not just regional benefits but national benefits. Any expenditure of Federal tax dollars should be subject to careful oversight in the Congress. The issue of accountability is one which certainly should be addressed.

As others have said, those of us from the Tennessee Valley have been concerned about ensuring accountability for quite some time.

Senator Sasser mentioned the large number of oversight hearings which he has conducted in the Appropriations Committee on TVA. As a member of the House of Representatives for 8 years, I, too, was concerned about ensuring accountability, and for that reason I took the initiative to create the Tennessee Valley Caucus, made up of all Members of the House and Senate from areas served by TVA. It was formed at a time when rates were increasing rather rapidly, and we consulted with the Board on a regular

basis about what the causes of those rate increases were and what might be done to slow them down.

We looked closely at the financial difficulties in the nuclear power program, the various management initiatives, environmental problems, and rates in general. For those of us in the valley, some of the problems that you highlighted yesterday do not come as something new to us. We have been concerned about these matters for quite some time.

I believe that as a result of the discussions that have been held over the past many years in the valley and here in the Congress, we have seen some significant changes. The testimony of the Board yesterday to the fact that for the last 3 years there have been no rate increases is some evidence of a change from what we were experiencing during the 5 years prior to that time.

But here is the important point that I want to make, Mr. Chairman, and Senator Lautenberg. When we formed this TVA Caucus and brought the Board members before us and asked these tough questions, we were very pleasantly surprised at how forthcoming and candid the Board was. We were glad to find they were every bit as eager as we were to grapple with these problems and to make sure they were solved.

I have to believe that as you sat through the testimony of the Board yesterday and heard their responses to your questions, you could not help but to have been impressed by the fact that they are forthright and eager to do a good job.

Of course there are problems, and you will not hear anybody from the Valley come before you and say everything is rosy. Of course there were mistakes made during the nuclear construction program.

But let me hasten to add that every single utility in the United States of America had serious errors in their estimates of what the electric power consumption was going to be in the United States.

Again, as part of an effort to achieve accountability, I chaired hearings in the House Science and Technology Committee on energy demand forecasting at the time these mistakes became apparent. We found, as I said, every utility made these errors. In fact, we found that the industrywide forecast back in 1973 overestimated national demand for electricity by the year 1980 by 700 billion kilowatt hours, equivalent to nearly 140 large nuclear plants or large coal plants. And if you had looked at the industry-wide projections of electricity need made in 1973 for the year 1990, it showed that they were off by nearly 400 large nuclear powerplants.

So this is a mistake that TVA made, but it was one that other utilities all across the country made also.

Incidentally, the effect of that projection error was likely to be greater on TVA because of its unique association with the nuclear fuel enrichment process, because if the nationwide projections of accelerating electricity demand and accelerating demand for nuclear powerplants had been correct, then the need for uranium enrichment services would have been more and the need for TVA electricity to run those plants would have been greater.

Conversely, when the projections of nuclear produced electricity fell short of the mark, that had an extra impact in the other direc-

tion on TVA because not only were they wrong on the projection of how much electricity would be needed in the Valley, but when the nationwide projections were off, that meant that they would be called upon to supply less electricity to the plants enriching the nuclear fuel for the entire country. So it has kind of a flywheel effect that made the impact even greater.

But as the Board members testified yesterday, even with that extra element, there were utilities around the country whose projections were even farther off the mark than TVA's.

TVA does serve as a national asset. When I served on the Energy and Environment Subcommittees in the House of Representatives during the years when the energy crisis was the No. 1 item on the agenda, time after time I found examples of where the Nation was searching for innovative solutions to reduce demand, to find new ways to generate energy, et cetera, and time after time they found programs already under way created by TVA that were able to be used by the entire country.

I mentioned yesterday the Home Insulation Program. This has been a tremendous success for this country. The Home Insulation Program has worked. Check and see where it came from.

I remember very clearly in the hearings that we held designing the nationwide Home Insulation Program, it was like a breath of fresh air when finally we got the testimony from TVA and they said, "Here is how to do it. We have already done it." And the people from utilities in the rest of the country said, "Boy, that sure looks good. Let's think about this for a while and see if it might work for us." They came back to the Energy Committee and said, "We believe this would be a good way to do it."

But the central point is: TVA had already thought about the problem and because of its sensitivity to its responsibility to the whole country had done a thorough job in designing the kind of program that could quickly be used in New Jersey and in New Hampshire and all across the country. And in fact that was the case.

It is only one of many such examples of efficient technology transfer from TVA to utilities around the country, as well as to Federal, State, and local government programs, to farm enterprises, and a wide range of businesses and educational institutions.

Clearly the TVA has in its half century of serving electricity customers in the Southeast given the country much more than a hugely successful experiment in public power and economic development. TVA has become a major laboratory for this country's efforts to find solutions to many tough energy and environmental problems.

I know you will hear from the environmental witnesses that you have scheduled later how far ahead TVA has gone in saying:

Look, sure these problems are tough, like acid rain, but we have a responsibility not just to the TVA region but to the entire country to demonstrate that acid rain can be solved.

You were talking yesterday, Mr. Chairman, about some of the commercial rates in other parts of the country where they are advertising they have an advantage over TVA. It is interesting that many of these areas, most of them, have utilities that have not yet

taken the steps that TVA has taken to control emissions and to deal with the problems of acid rain that the Northeastern United States is suffering the brunt of.

If other utilities around the country had shown that kind of foresight and concern for the entire country, then I would submit to you that the acid rain problems would be far less severe than they are now.

And as other utilities are forced to deal with this problem as we in the Congress say, "Look, you have to do something about acid rain," once again they will be able to turn to the example TVA has provided—not only to the specific technology but to the operating experience that TVA has had. How do you put it in? How do you make it work? This, too, is one of the contributions that TVA has made to the rest of the country.

Let me deal briefly with a couple of issues that came up yesterday. At the very end of the hearing I made a brief statement about the Federal Financing Bank, but I want to return to it briefly while Senator Lautenberg is here and while others are here because I wish there was some way that we could put this particular issue to rest.

The fact is that not one dime of taxpayers' funds has ever gone to subsidize a TVA bond issue through the Federal Financing Bank. Moreover, as Richard Freeman clearly pointed out yesterday, the taxpayers have actually benefited from TVA's borrowing through the FFB as a result of the sizable fees that TVA pays to completely cover the taxpayers' expenses plus a little bit.

Since it began using the FFB authority for its borrowing, TVA has paid to the U.S. Treasury more than \$100 million in special fees to more than cover all of the taxpayers' costs. \$100 million is quite a lot. That is, of course, in addition to the annual payment to the Treasury—last year it came to \$114 million—to reduce the deficit; something that no other public power entity created by the Government is doing in this country the way TVA is doing at current market rates.

So I mentioned there are two separate questions. Is the FFB borrowing authority a good deal for the TVA ratepayers? Yes, it probably is. Is it a good deal for the taxpayers? Yes, it is.

And if this is a natural advantage coming out of the structure of TVA, let's not just look for problems, let's look for opportunities as well. I know that you are interested in doing that.

You said, Mr. Chairman, that you wanted to be a champion of TVA's ratepayers yesterday. Those of us from the Valley welcome your determination to champion the cause of TVA ratepayers. I say that very sincerely. I ask you in that light to look closely at what the impact on TVA ratepayers would be of removing the access to the Federal Financing Bank. While it would not save the taxpayers of this country in New Hampshire or New Jersey or anywhere else in the country, or Tennessee, while it would not save the taxpayers not one thin dime, it would cost TVA ratepayers between \$200 million up to as much as \$1.2 billion in added borrowing costs, from 1974 up to the present time.

So if you wish to be a champion of the TVA ratepayers, please take a close look at what that proposal would do.

I do want to welcome the subcommittee to come to the Valley. You mentioned at the outset of today's hearings that you might want to come down and have field hearings. We want to roll out the red carpet for you and make you welcome in the Tennessee Valley, and we will look forward to talking with you further about that.

Thank you for your courtesy and the chance to testify.

Senator HUMPHREY. Thank you, Senator Gore.

Senator LAUTENBERG. I, too, join the Senator in welcoming you and appreciate your statement. I am just struck by one thing, and it doesn't call for a response. That is the FFB borrowing capacity is something that I think all utilities throughout this country could use. Ultimately the ratepayers pay the freight, so to speak. I do think that that is a distinct advantage, and true, the taxpayers of the country have their expenses covered by the service fee. It is an eighth is what we heard yesterday. But I don't think it fair to deny the fact that this is a very special asset that the TVA has.

Senator GORE. I don't disagree with that. I think there is a distinction, Senator Lautenberg, between something which is an advantage to TVA on the one hand and something which is a taxpayer subsidy on the other hand. If something can be an advantage without creating a disadvantage to the taxpayers, then what is wrong with it? And after all, the FFB came to TVA and said, "We want you to join this program."

You know, there are several structural advantages that TVA has. The combination of flood control and hydroelectric generation, they go together naturally. It flows out of the structure. The ability of TVA to join in the Federal Financing Bank is another such advantage. But if the taxpayers are not subsidizing it, then it seems to me that it is not hurting anyone.

Senator LAUTENBERG. Thank you.

Senator HUMPHREY. Thank you.

Next on our list is Senator Ford.

STATEMENT OF HON. WENDELL R. FORD, U.S. SENATOR FROM THE STATE OF KENTUCKY

Senator FORD. Good morning, Senator Lautenberg and Mr. Chairman. It is a real pleasure to appear before you this morning in conjunction with my distinguished colleagues to discuss the Tennessee Valley Authority. I appreciate your providing this forum so that we can discuss the merits of this unique, sometimes misunderstood, but extremely valuable institution.

As a former Lieutenant Governor, Governor, and now Senator these last 10 years from the Commonwealth of Kentucky, I am here to tell you from first-hand experience of the great contribution TVA has made not only to my State but to the South and, indeed, to the Nation.

For over half a century TVA has demonstrated the success of its unified resource development program, incorporating the judicious use of natural resources, sensitivity to the environment, innovative approaches to the economy, and community development, groundbreaking scientific research, and the provision of electric power at reasonable rates.

TVA's economic, agricultural and fertilizer development programs have done much over the years to increase per capita income among Valley residents. Since the per capita income in the Valley was about half the national average 50 years ago, there can be no question as to the value of TVA's contribution.

Yet, the job is still unfinished. Per capita income has recently slipped back to less than 80 percent. TVA remains the principal Federal entity in the area able to deliver the kind of broad-gauge technical assistance that can help bring the region fully into the mainstream of the American economy.

But there is a broader and, in many respects, more significant dimension of TVA that should not be overlooked in a discussion of the more local and familiar. TVA is a national laboratory, a testing ground, that benefits all citizens of this nation. This was clearly President Franklin Roosevelt's conception when TVA was created in 1933, and it has been strengthened by the philosophy and actions of the TVA Board members.

In the testimony that you received yesterday and that you are hearing today, you have been given numerous examples of TVA's role as a national laboratory. In two such activities in Kentucky, which I am going to discuss a little more in detail, the major beneficiaries are the people of the United States wherever they may reside.

These two programs belie OMB's assumption that TVA is little more than a regional power producer whose nonpower programs duplicate the national programs of other Federal agencies and exemplify what TVA is really all about. They are the recreation and education facility known as "Land Between the Lakes" and TVA's world respected work in the field of atmospheric fluidized bed combustion.

First let me discuss briefly the Land Between the Lakes.

TVA's Land Between the Lakes [LBL] is a 170,000-acre facility with over 300 miles of undisturbed shoreline that is located in western Kentucky and Tennessee. LBL is the second largest contiguous public land area east of the Mississippi—only the Great Smoky Mountains National Park is larger—and is within a day's drive of over 75 million Americans. Last year over 2 million visitors from all 50 States and 20 foreign countries came to LBL.

LBL is the hub of a \$150 million tourism industry in Kentucky. In 1984, LBL visitors contributed \$45 million to the local economy and created an estimated 2,000 full-time jobs. LBL has also been a magnet drawing additional public and private investment to western Kentucky.

For example, its existence was a major influence on the Commonwealth's decision to build the multimillion dollar Lake Barkley State Resort Park near an LBL main entrance.

But LBL is more than the single most important recreation spot in Kentucky. It is also a national demonstration facility that tests innovative approaches to resource management, scientific research, and education. These innovations are currently providing benefits to both Kentucky and the Nation.

Successful programs at LBL are restoring the once native bald eagle and other birds of prey to the wild.

LBL's education programs provide hands-on training for hundreds of professionals and students in the fields of resource management, recreation, and environmental education. These students—some 800 to date—have come from universities from California to Maine.

The National Science Foundation named LBL as part of the national experimental ecological reserve network, making it one of 96 sites—only one of two sites on a major reservoir—selected for long-term field research projects.

Kentucky is one of two States without a national wildlife refuge, but LBL helps fill this critical need.

LBL and the University of Kentucky have developed an outdoor education training program for those who work with the handicapped. This program has already spread to 12 Southeastern States and the District of Columbia.

In cooperation with USDA and the U.S. Army, LBL and TVA played an instrumental role in the development of an effective chemical control agent now used nationwide for ticks—a major nuisance and public health problem throughout the United States.

Land Between the Lakes conducts an official Boy Scout program that allows handicapped Scouts to engage in the same outdoor activities that their more physically able peers do. This program is unique in the Nation, and if we are forced to divide up LBL and sell off the portions to the highest bidder, this valuable program will be lost to America's handicapped Scouts.

Because of its unique resource management program, LBL is part of an international training program for Government natural resource officials from less developed countries.

These representative examples clearly show that LBL is far more than just another national park. It is currently contributing in a wide range of areas that have international and national, as well as local, application.

Let's talk about atmospheric fluidized bed combustion projects just a moment.

Another case of TVA leadership is its demonstration of atmospheric fluidized bed combustion [AFBC] as a power generation option for electric utilities. This advanced coal burning process uses more abundant and less costly high-sulfur coals—including Kentucky coal—in an environmentally acceptable manner. Such coal has limited use in conventional powerplants at this time due to environmental standards, as you well know.

As the Nation's largest supplier of electricity, with experience gained in the operation of fossil facilities, TVA is in an excellent position to demonstrate AFBC technology to the utility industry. TVA took its first steps in 1979, with the support of the Federal Government, in developing this technology for the Nation's utility industry by constructing a 20-MW AFBC pilot plant located on the TVA Shawnee Steam Plant site in Paducah, KY. This plant is the largest AFBC unit to operate under utility conditions and since its startup has operated over 10,000 hours and consumed approximately 59,000 tons of high-sulfur Kentucky coal.

Based on the successful operation of this pilot facility, TVA has embarked on an even more significant demonstration—the planned replacement of one of its existing pulverized coal boilers at the

Shawnee Steam Plant with a 160-MW AFBC boiler. The proposed replacement of an existing boiler with an AFBC unit is particularly significant to the electric utility industry since retrofitting existing steam generation units with AFBC boilers is a likely initial application of this advance technology.

The utility, coal, railroads, and other industries have recognized the national importance of this project, and only \$30 million of the project's estimated \$220 million cost will be provided by Federal taxpayers. The remaining funds will be provided by revenues from TVA's self-financing power system, the Electric Power Research Institute, the Commonwealth of Kentucky, Duke Power Co., Combustion Engineering, other utility companies, major coal producers, and railroad companies.

Because of TVA's pioneering program, AFBC coal-fired plants are expected to be an available alternative to more traditional coal-fired plants with scrubbers in the mid-1990's. This technology is particularly important to coal-producing States like Kentucky, electric utilities, and the consumers of electric power, since AFBC plants have numerous advantages when compared to more traditional coal-fired plants with scrubbers.

Mr. Chairman, I will skip over most of the balance of my statement and ask that it be placed in full in the record along with the following: Senate Resolution No. 15, adopted by the Kentucky Senate on January 10, 1985, urging the rejection of OMB's recommendation that the TVA budget be reduced to \$38 million; a statement by G. Wendell Combs, secretary of the Kentucky tourism cabinet, before the Senate Appropriations Committee; a resolution of the Kentucky Flood Control Advisory Commission regarding the TVA Floodplain Management Program; a letter from Raymond M. Burse, president of Kentucky State University, describing the effect the proposed cut would have on 1890 land grant institutions throughout the Tennessee Valley region; and a letter from the Sierra Club expressing detailed concern that TVA's mission to conserve the natural resources and protect the environment of the Tennessee Valley cannot be adequately accomplished subsequent to such a drastic budgetary cut.

Senator HUMPHREY. Without objection, so ordered.

Senator FORD. Mr. Chairman, I understand you announced this morning that you probably would hold field hearings in the area. We welcome you there. You might even visit one of your friends at Kentucky Lake and enjoy what TVA has done as it relates to Land Between the Lakes.

Since you are looking for citizen input, I have a letter that I would like to read for the record, Mr. Chairman, with your permission. I think this is a credit to the witness.

It says:

A few days ago I received a call from Senator Gordon Humphrey's office regarding a hearing on the "privatizing" of TVA, set for July 15th, 19th and 20th. If you will recall, I have had some history of experience with the TVA.

This letter is to express my total opposition to the idea of "privatizing" the agency. Undoubtedly most Federal agencies can be improved on, but the idea of cutting the Land Between the Lakes up into blocks and selling it off to the highest bidder and parceling the power units out to the private utilities is disgraceful.

I am aware organizations that are opposed to the "privatizing" idea have been denied time before the Humphrey Subcommittee. Will you please use your good of-

fices to see that my enclosed statement is made a part of the Humphrey hearing record?

Sincerely, Corinne Whitehead.

I would like, since you have agreed, to have her statement included in the record.

Senator HUMPHREY. Fine. [See p. 534.]

Senator LAUTENBERG. It is just always a pleasure for me to sit with Senator Ford. He is a man of considerable experience, and I listened very carefully to what you had to say. I too look forward, if the chairman so instructs, to holding a field hearing down there, to join you in beautiful Kentucky, Senator Ford. We would expect you would be as gracious a host to us there as I have been here this morning.

Senator FORD. I tell you, we will give you all the time you want, Senator. I am afraid if we give you too much time you may not want to come back.

Senator HUMPHREY. Senator Burdick.

Senator BURDICK. Senator, as usual, you are most convincing.

Senator FORD. Thank you very much. I hope that continues.

Senator HUMPHREY. Thank you, Senator Ford. Our next witness is Senator Howell Heflin.

Good morning.

Senator HEFLIN. Good morning.

Senator LAUTENBERG. I join in welcoming the distinguished Senator from Alabama, a former Supreme Court Justice, a man of considerable talent. It is a pleasure for me to be on the senior side when I am in such a junior position.

STATEMENT OF HON. HOWELL HEFLIN, U.S. SENATOR FROM THE STATE OF ALABAMA

Senator HEFLIN. Thank you very much.

I think the general overall relationship of TVA and the Nation has been covered. I won't spend a lot of time. I will be very brief.

I won't be as brief as the story I heard of a man that had been out late at night with the boys playing poker, drinking, carousing, and he came home and his nerves were a little unsettled and he couldn't get the key into the lock of the door, made a good deal of noise. His wife came to the door and slung open the door, and he sort of splattered inside and fell to the floor and looked up and she said, "What have you got to say for yourself?" He replied, "I don't have any opening statements, but I will be glad to respond to questions if I am asked."

I won't be that brief, but I do want to just mention one aspect of TVA and not try to hit a broad brush. I think that has been adequately covered, from its comprehensive approach to regionalism, its importance to the Nation as a whole, except in one aspect. That is dealing with agriculture.

Agriculture today is one of our most serious problems. I suppose from the budgetary side we spend tremendous amounts of money, but nevertheless the farmers are in terrible condition. They are in a depression. They are not in a recession. There has been no rebound for the farmers. This is nationwide. We have a real problem.

I am on the Agriculture Committee and we are groping, trying to find solutions. Senator Cochran is on it, a very able man. He and I are going to meet later on trying to deal with an aspect of the new farm bill.

But all of a sudden we realize that farm production is 40 percent fertilizer, what we produce. It really comes totally, after allocating on an accounting basis, that 40 percent of our farm production comes from fertilizer.

There is only one world research center for fertilizer, and that is at TVA in the Muscle Shoals area, the National Fertilizer Development Center. In the last 30 years, three-fourths of all the patents and new technologies that have been developed in fertilizer have come from this great brain bank and brain center relative to fertilizer. They have assembled some 225 Ph.D.'s, and this has been subject to attack. It is something I think we ought to defend. It is an important aspect as we meet with the problems of agriculture, and it is really the only center.

The editor of the Farm Chemicals magazine stated recently TVA is the fertilizer industry's NASA. In assessing the National Fertilizer Development Center, Ellis K. Fields, president of the American Chemical Society, stated that there is no similar broad-based fertilizer effort anywhere else in the United States or the world, for that matter.

He also said the importance to the United States of maintaining strong fertilizer research capabilities cannot be overemphasized. Resource and energy situations are continually changing and so are farmers' specific plant nutrient needs. A strong and continuing research effort is required to be responsive to such change and to guarantee that the Nation will continue producing food for itself and others.

Now, the evolution of a new and more productive fertilizer from the test tube at the National Fertilizer Development Center to a cornfield in Iowa or Nebraska or New Hampshire or to a dairy farm which is important because of its use of feedgrains in Vermont, takes time.

Much of this research is long term, high risk, but the yields are impressive. For example, the development of low-cost production technology has resulted in a present worth savings of \$8.5 billion from seven major fertilizer advances developed at the National Fertilizer Development Center. It is estimated that the total present value of benefits from the employment of high analysis material as projected to 1990 is almost \$49 billion. And through 1981, this program provided annually over \$20 in benefits for every dollar of appropriated funds invested.

In addition to this, this National Fertilizer Center is focusing on a new way to produce an ammonia which is important in the development of fertilizer, due to the fact that we may some day be faced with a fuel shortage, since it comes from natural gas.

In addition to this, they are making real research in the technology of making ethanol from woodchips and other cellulose materials which, of course, are widely available in the Tennessee Valley.

Now, this is very important as to farming. As I pointed out, 40 percent of all of the production comes from fertilizer. If this is displaced, I think it would set back agriculture 25 years. So it is important, in my judgment, that this National Fertilizer Development Center be kept, that it be helped, and at the same time it is moving in a manner to get greater participation from private industry. Plans are afoot to develop this. I think that this can be developed.

I think this is important in this aspect, particularly for agriculture today. Food for the world is an important issue. I hope that this is something that will be thoroughly investigated and that the importance of it will not be dismissed.

Thank you.

Senator HUMPHREY. Thank you, Senator Heflin.

Senator LAUTENBERG. Thank you, Senator.

Senator HUMPHREY. Our next witness is Senator Thad Cochran. Good morning, Senator Cochran.

**STATEMENT OF HON. THAD COCHRAN, U.S. SENATOR FROM THE
STATE OF MISSISSIPPI**

Senator COCHRAN. Good morning, Mr. Chairman.

Mr. Chairman, I appreciate very much your giving me an opportunity to testify this morning at your hearings looking into the activities of the Tennessee Valley Authority.

I have a prepared statement which I hope you will be able to include in full in the record.

Senator HUMPHREY. Yes, of course.

Senator COCHRAN. I am glad to be able to take advantage of this opportunity to let you know a little bit about the substantial impact that TVA has in my State of Mississippi.

I am proud to be a part of the group of U.S. Senators who are here this morning to testify about their personal knowledge and information that can be helpful to the committee as it reviews the TVA.

My friends from Tennessee, Kentucky, and Alabama have very eloquently stated some specific areas of interest that especially affect their areas and their States. Let me just tell you a few things that I feel are important as you consider this subject at your hearings.

For more than 50 years, the TVA has made a significant investment in my State of Mississippi of financial as well as human resources. As an example, this year TVA will employ in my State 181 people and have a payroll of more than \$4.8 million. But more than just providing electric service to 36 of our Mississippi counties, TVA has helped make the standard of living much better for many of our rural communities by providing this electricity and by also assisting in other program areas, to assure important contributions to our State's economic and agricultural development. TVA works with State as well as local governments and other Federal agencies and the private sector to promote economic growth.

As an example, TVA is working right now in the Tennessee Tombigbee corridor to focus on the transportation advantage of the Tennessee Tombigbee Waterway in the expansion of markets for wood products. This is an industry that may be our State's greatest economic asset, the wood and wood products industries.

TVA's efforts to enhance the quality of the natural resources of the area are evident in our State. There is a comprehensive water supply planning effort involving 80 small water systems in six counties that is being conducted this year to develop dependable community and industrial water supplies.

It is difficult really to conceive of Mississippi's progress in agricultural development without recognizing the contributions of TVA. TVA has worked with our land grant universities, the Department of Agriculture and its agencies, and State and local organizations, to help increase agricultural productivity and income and to bolster the overall economy of the region.

Another example of its activities, Mr. Chairman, is the coordination by TVA of a multi-agency effort to combat soil erosion throughout the seven-State region.

It is impossible to list the thousands of projects which TVA has participated in over the last five decades. But let me say that it is without any doubt in my mind that TVA has meant progress for the people of Mississippi, the Valley region, and the Nation as a whole.

I want you to know, Mr. Chairman, that I appreciate having a chance to let you know of the substantial benefits that accrue from the activities of TVA in the State of Mississippi and throughout this area. I appreciate your permitting me to testify, and thank you for conducting the hearings.

Senator HUMPHREY. Thank you, Senator Cochran. We are pleased to have your assistance.

Inasmuch as Senator Denton and Senator McConnell have not yet arrived, we will call upon Representative John Duncan as our next witness. Congressman, glad to have you here. Good morning.

STATEMENT OF HON. JOHN J. DUNCAN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TENNESSEE

Mr. DUNCAN. Thank you, Mr. Chairman. I appreciate the opportunity to testify before this subcommittee. I want to congratulate you for your interest in the Tennessee Valley Authority and for your care in preparing for the oversight hearings, which I know are viewed by all of us as an opportunity for reviewing our unique Federal corporation in Tennessee.

I have a detailed statement which I would ask unanimous consent be entered in the record.

Senator HUMPHREY. Of course.

Mr. DUNCAN. Mr. Chairman, in addition to my duties in the House of Representatives I have been a businessman in Knoxville. I tend to look at these things as a businessman would. To me, the Tennessee Valley Authority is a business.

I am also a lawyer. As I read the enabling act which our colleagues passed to create TVA 52 years ago, their intent is clear. TVA was intended to be operated as a business.

The questions we must ask have to do with the congressional charges for TVA and how well the agency has obeyed its congressional charges. Briefly, these were the TVA's major responsibilities: improve the Tennessee Valley through flood control; improve navigation along the Tennessee River; produce electric power at the lowest feasible rates; conserve and develop the region's natural resources; and promote the economic and social well being of the people.

In each of these endeavors, Mr. Chairman, TVA by any standard or measure has done well. Yesterday you heard the TVA Board of

Directors cite the agency's record during the past half century. I will not take up this subcommittee's time with a repetition of these accomplishments.

Rather, I would prefer to challenge the subcommittee to consider the future of the TVA. It is a future that is both hopeful and challenging. But there is a hopeful message in the TVA that these problems that we have in our Valley can and will be solved.

In many instances TVA plays a major role in coming up with a common sense solution as a central part of the answer.

Mr. Chairman, I would like to just include the rest of my statement in the record. I know we have several of our colleagues waiting and we are being pushed.

Senator HUMPHREY. That is just fine. Senator Lautenberg.

Senator LAUTENBERG. Nice to see you.

Senator HUMPHREY. Thank you very much, Congressman. Glad to have you here this morning.

We will return now to our witness list and call upon our colleague, Senator Mitch McConnell.

STATEMENT OF HON. MITCH McCONNELL, U.S. SENATOR FROM THE STATE OF KENTUCKY

Senator McCONNELL. Thank you very much, Senator Humphrey, Senator Lautenberg. I appreciate the opportunity to be here this morning to speak on behalf of the Tennessee Valley Authority, which is critically important to the western part of Kentucky. I know my colleague, Carroll Hubbard, Congressman from the First District, is behind me. He has been a big supporter of this, and I am glad to see him here as well.

TVA is a unique corporate-Government hybrid, designed to bridge the gap between private and Government enterprise. It has a long history of working with public and private groups at all levels to achieve a variety of goals without creating expensive dependencies on Federal bankrolls.

By providing technical assistance, TVA attracts many more private dollars for its cooperative programs than it makes available in seed money. This way the private sector shares in both the responsibilities and the rewards of economic development. This, it seems, represents the very theme of the 1980's.

Through these types of partnerships TVA has used its relatively small appropriated budget to serve as a catalyst for growth and change. But while private industry, States, communities and other organizations have been valuable partners, we must not assume that they will fill the vacuum, if wholesale budget cuts should suddenly force TVA to and most of its nonpower activities.

Instead, vitally important work would go undone—work whose benefits are felt way beyond the borders of the Tennessee Valley region.

This work includes the development and demonstration of new fertilizers that have long helped feed this country and the world. It includes the study and control of air pollution and ground water contamination. It includes innovative waste disposal programs that are successfully demonstrating how communities can deal with the various types of waste problems.

In its role as a national laboratory, the Tennessee Valley Authority performs services to our society that would demand the highest priority, certainly not the lowest priority.

One project that typifies TVA's laboratory function is its demonstration of a technology for burning coal called atmospheric fluidized bed combustion. The beauty of this process is it is both environmentally sound and cost effective.

By capturing 90 percent of the sulfur normally released during coal combustion and reducing the production of nitrogen oxides, fluidized bed combustion boilers can allow powerplants of the future to meet environmental requirements at a significantly lower cost than the best technology now in use.

This economic advantage can be very important. Today we have coal reserves that can no longer be used economically for power production because of clean air emission limits. The result is widespread unemployment of mine workers, at great economic and social cost to the Nation.

TVA's work on the fluidized bed combustion process is so promising that private utilities, railroads, and coal companies have committed \$166 million to TVA's commercial-scale demonstration plant, which is scheduled for groundbreaking in September. This private money represents over two-thirds of the total investment in the project, with TVA, the Department of Energy, and the State of Kentucky making up the rest.

Although other Federal agencies have been involved in this research TVA's combination of experience in power production, coal technology, energy research, and environmental efforts has put it in a position to carry forward this national demonstration project for commercial application.

In the 1960's TVA was chosen to conduct a very different type of national demonstration. It too reflects the value of having an organization with this unusual combination of tasks and experience.

TVA was looking for economic development opportunity in a rural area that has no industry and only limited prospects for agriculture. But it did recognize one potential asset—a 40-mile strip of woodland that would be nearly surrounded by water with the completion of a new Corps of Engineers reservoir project.

Here was a natural opportunity to create the second largest national recreation area east of the Mississippi River. TVA proposed Federal management of these 170,000 acres in order to demonstrate how the area could be turned into a national asset.

The Department of Interior agreed, but the Park Service had other projects pending, and prompt action was needed to establish the long-term use of this land. So on the recommendation of the Secretary of the Interior, President Kennedy charged TVA with developing the Land Between the Lakes area as a national demonstration in outdoor recreation, environmental education and resource management.

In the 22 years since the Land Between the Lakes was established, millions of students, teachers, sportsmen, photographers, scientists, farmers, and vacationers have taken advantage of its programs and services. Last year alone, more than 2 million people visited Land Between the Lakes from all 50 States and from 20 countries.

In this living laboratory, people participate in a range of activities available at no other one place in the country: fishing and hunting, astronomy and anthropology workshops, wildlife photography, solar energy demonstrations, timber harvesting, and many, many others.

Today, LBL serves as the focal point for a \$150 million annual tourism industry in the area, meeting the hope of economic opportunity that led to the original conception of this project in TVA.

But its benefits extend far beyond the local area. For example, LBL provides professional development in the fields of resource management, recreation, and environmental education. TVA does this by bringing university students, faculty members, and other professionals to LBL for firsthand study of multiple resource management. Through a mix of internship programs, conferences and seminars, TVA helps transfer ideas and technology to other public and private organizations.

Second, LBL sponsors activities for innercity and physically handicapped children. LBL also provides outdoor educational training for teachers and parents of handicapped children from across the country. These adults then pass on what they learn to others back home, resulting in educational programs for thousands of handicapped students all over our country.

Third, LBL's eagle restoration project has demonstrated that an endangered bird population can be reestablished in its former breeding range. TVA sponsored this highly successful project with other Government and private agencies, businesses, and citizens. As a result of TVA's experience with eagle restoration, a nonprofit organization called Eagle Trust International has decided to move its headquarters to LBL to work with TVA on expanding the propagation effort.

Primarily because of LBL's unique forest management program, TVA has been involved in an international natural resources training program for Government officials of less developed nations. Because many of these countries have limited areas, their leaders come to LBL to learn how to acquire many diverse benefits from one piece of land.

LBL is such an ideal outdoor laboratory that the National Science Foundation has selected it to be part of the National Experimental Ecological Reserve Network. That means that LBL is one of 96 sites that will ensure long-term availability of field research for scientific use.

In addition to indicating the variety and value of the LBL's programs, these examples suggest the widespread support LBL enjoys from the scientific and educational communities from local, State, and Federal Government, and, most importantly, from the general public.

The American people recognize the national asset they have in Land Between the Lakes. Indeed, 1,000 citizens who feel strongly about it formed a private, nonprofit organization last year to help preserve and improve LBL for future generations.

This Land Between the Lakes Association is working outside the Federal system to secure private sector financing for certain LBL-related activities and to provide the people needed to expand LBL's program capabilities.

But even with this considerable support from the private sector, LBL's educational and demonstrational efforts would be severely curtailed or terminated if its funding is eliminated or is reduced to simply allow the area to remain open.

The proposed Federal budget and the Senate budget resolution assume that once orphaned, LBL will be embraced by some other agency. There is a major fallacy to this premise. Either funding would be continued, which is unlikely, and the public would experience no real savings, or the value of Land Between the Lakes to the Nation would be severely diminished and the public's past investment squandered.

Scientists and Government officials around the world visit the Tennessee Valley by the hundreds to learn from TVA'S experience in energy, environmental protection, natural resource management, economic development, and a host of related fields. I think it is time the U.S. Congress recognizes the national treasure it has right in its own backyard.

As we go about the essential business of deciding how and where to cut the Federal budget, I hope we will not simply lop off three-quarters of TVA's appropriations because some say it won't make any difference. It will make a great deal of difference in places such as Land Between the Lakes and with TVA's other national resources programs. This subcommittee, above all, should recognize the importance of TVA's contributions to the Nation.

Thank you very much, Mr. Chairman. I appreciate the opportunity to be here.

Senator HUMPHREY. Thank you, Senator McConnell.

We will next call upon Representative Carroll Hubbard of Kentucky. Good morning, Congressman.

STATEMENT OF HON. CARROLL HUBBARD, JR., A REPRESENTATIVE IN CONGRESS FROM THE STATE OF KENTUCKY

Mr. HUBBARD. Good morning, Senator Humphrey. Thank you very much for the privilege of appearing before your subcommittee.

In following my good friend and colleague, Senator Mitch McConnell, I want to first compliment him upon being already a prominent and successful U.S. Senator from our Commonwealth of Kentucky. He and I are of different parties, but he and I are good friends. I am one of his admirers, and I appreciate his excellent testimony before your committee this morning.

Mr. Chairman, I would ask unanimous consent that my remarks be entered in the record in their entirety.

Senator HUMPHREY. Yes, of course.

Mr. HUBBARD. My remarks will be brief because I am supposed to be in the House chairing a subcommittee at this particular time, and my colleagues are waiting to testify also, and we do meet at noon.

Certainly I would endorse the comments by Senator McConnell who has covered so well how important TVA is to Kentucky. TVA is important to our coal industry. In the late 1970's, TVA began developing an advanced coal burning process for the Nation's electric utility industry. The benefits of TVA to Kentucky and to other States will be commented upon by my colleagues who have preced-

ed me and who will follow me in testifying before your committee this morning.

I would like to emphasize, if I may, one part of my testimony, and that is how important TVA is to western Kentucky as to our 170,000-acre Land Between the Lakes facility to develop recreation and natural resources-related advances of benefit to the entire Nation.

Western Kentucky needs this Land Between the Lakes facility. It is of great advantage to us touristwise. It is of great benefit to those of us who live in western Kentucky.

One of the most frequently asked questions I am asked back home in western Kentucky is how can you folks in Congress send so many multihundreds of millions of dollars to foreign aid and yet would consider a 70-percent cut in the budget for the Tennessee Valley Authority nonpower related budget? Naturally they are thinking of Land Between the Lakes, and they know of its benefit to our area of western Kentucky. They cannot imagine TVA's nonpower budget being cut that much.

In all fairness, my constituents, who are very concerned about the Federal deficit, would like to see the Federal deficit cut across the board, including a minor cut to TVA, but nothing like 70 percent, which would be devastating to many of the nonpower uses of TVA.

Land Between the Lakes has been involved with the U.S. Department of Agriculture and the U.S. Army in a number of research and demonstration projects. Land Between the Lakes has been useful even to Fort Campbell, which is located in my congressional district as well as in part of Tennessee.

I could go on and on in my remarks of five pages, Mr. Chairman, but I think you know that I have earlier said that what Senator Mitch McConnell has said, as we heard him immediately preceding me, is exactly my strong urgings for this committee. I hope that you will realize the importance of TVA from New Hampshire to California; indeed, of its great benefit, I repeat, to Kentucky and especially to my western Kentucky district.

Thank you for the privilege of appearing before you.

Senator HUMPHREY. Thank you, Congressman. We are glad to have you here.

We will next call upon our colleague, Senator Jeremiah Denton. Senator Denton, good morning.

STATEMENT OF HON. JEREMIAH DENTON, U.S. SENATOR FROM THE STATE OF ALABAMA

Senator DENTON. Thank you, Mr. Chairman, and I thank the gentlemen who have allowed me to proceed at this time. I know we all have things to do. I have two other meetings at this time besides this.

Mr. Chairman and members of the subcommittee, I appreciate the opportunity to join my colleagues from the Tennessee Valley congressional delegation to testify today. I want to commend you, Mr. Chairman, as usual, for doing your duty thoroughly, with determination and yet with consideration for all the factors. We are

at the point where the Congress must exercise its responsibility to oversee the programs of the TVA.

Mr. Chairman, I have just a few points I would like for you to consider.

I am aware that TVA's appropriated budget will have to be reduced. I am with you in being as determined and as thoughtful as we can about the need to reduce our deficit.

My second point is that I believe the proposed 70-percent reduction is far too drastic and it is not reflected in any similar budgetary action in a comparable kind of a program.

Third, I believe that it is necessary to carefully review the programs under TVA's appropriated budget.

Fourth, let us recognize that there are national and regional considerations here as well as local ones.

Last, that the TVA region, including northern Alabama, should be seen lagging economically behind most sections of the Nation. It would not be compassionate nor realistic not to deal a bit more deliberately with this situation.

I am here on behalf of my constituents in northern Alabama and here to express my own concerns that the proposed 70-percent reduction should be carefully reviewed before Congress takes any final action.

I realize that a substantial reduction in the Federal deficit is a top priority and that TVA's appropriated budget is a matter which in that context should be addressed. But a 70-percent reduction is not the best approach. It is like taking a meat axe where you need a carving knife or a scalpel.

I would hope that you, Mr. Chairman, with your sense of reality, your sense of courage, both of which I have noticed and benefited from in terms of being edified, will be brought to bear on this question and that the different programs under TVA's appropriated budget will be looked at and judged on their own merits with more deliberation than has been the case in the resolution before us.

A 70-percent reduction would have an absolutely devastating effect on the economy of northern Alabama. Alabama continues to have the third highest unemployment rate in the Nation. It is not these people's fault. They are good workers. All of a sudden because of some miscalculations on the part of those who must make predictions they find themselves facing unemployment.

The unemployment rate for Alabama in May was 8.7 percent. In northern Alabama, however, the unemployment rate is approximately 15 percent in the northwest section. The unemployment rate is approximately 12 percent and increasing in Jackson county in the northeast. A study done earlier this year by North Alabama University stated that closing the National Fertilizer Development Center would increase unemployment in the area from 15 to 25 percent in the Shoals area.

I support reducing our Federal deficit, but I am not for doing so rather arbitrarily with no consideration to human beings.

Under the proposed 70-percent reduction, the water resources, land—forest resources—Land Between the Lakes, economic resources, community resources, agricultural resources development, recreational facilities, and chemical facilities programs would be

zero funded. In addition, funds for the National Fertilizer Development Center would be reduced from \$36 to \$10 million.

I know that a question in the chairman's mind is whether it is necessary for TVA to continue these programs. I believe that, where possible, the private sector should assume the responsibility of meeting the goal of furthering economic development in the TVA region. I hope, however, before we inconvenience these people to the extreme point of simply cutting out their employment and, therefore, bringing to bear the other necessary governmental assistances, which they don't want, that we recognize the significance of this rather extreme act we are considering. The National Fertilizer Development Center and the TVA Soil Conservation Program, run in conjunction with the Department of Agriculture, are two examples of programs that benefit the entire Nation. I have found great difficulty in understanding why we are taking such a scythe-like sweep at those two programs.

I strongly oppose taking action that would result in the shutdown of the National Fertilizer Development Center. I am sure you would be pleased to know TVA is working with the private sector and the administration to phase out funding to the development center. I support that.

I would ask you personally, Mr. Chairman, to recognize that a \$4.1 billion program in my State which was going to require all Federal money was the point of focus of the entire Alabama delegation. When I came here, I was the only one to oppose it at first. I wanted private money for it. We ended up moving in that direction. The whole delegation said that. I have learned a lot from them since I have been here. I don't mean to be condemning. I think in that particular case it emphasizes that we should do it with private funding.

I will continue to work toward a mutually satisfactory timetable to meet the goal. The NFDC is the only National Fertilizer Research Center in the Nation. It benefits not only our country but the whole world. The knowledge spread from the National Fertilizer Research Center can help feed people throughout the world. We should continue its operation for the benefit of agriculture and consumers to protect the jobs in the Shoals area. Granted, we should work to reduce the Federal obligation.

One of TVA's goals under the act is to promote economic and community development. Those programs would be zero funded. TVA has provided technical assistance to localities in the private sector to create job opportunities and promote the general welfare of the public. Many mayors and city councils in northern Alabama believe TVA's assistance is just as necessary today as it has been in the past. We must take note of those local observers.

Mr. Chairman, the Tennessee Valley region still lags behind the rest of the country in economic growth. It is a complex question. TVA has been an evolving animal over the years. It is not its fault entirely that some of its difficulties have come about. I believe that the Nation and TVA would benefit by a better planned and gradual approach of looking at how we are making our corrections rather than make them so suddenly.

Mr. Chairman, there is one other matter that I want to discuss. I must express my concerns about TVA's decision again to slow

down construction of the Bellefonte nuclear powerplant in Scottsboro, AL. Based on its recent load forecast, TVA has concluded the Bellefonte plant will not be needed until 1993. The decision will have a major negative effect on the economy of Jackson County and surrounding areas. As many as 1,980 employees will be affected by the decision.

Mr. Chairman, I am sure that we agree that we shouldn't go ahead with projects if they are not justified by need and economics. But the decision was sudden and different from the prediction made before. It heaps more difficulty on the heads of the people in that area. That wrong decision, as it was before, does raise questions about the reliability of TVA's load forecasts for the future predictions of the energy needs in the region. It raises major questions about the management of TVA's nuclear program.

I think TVA is trying to solve a difficult situation, but it is not finished doing that. Its problems have a major effect on many people. They are simply victims of poor estimations on the part of others. I hope we can address this problem in a constructive manner.

I certainly encourage TVA to continue the reorganization of its management of the nuclear program. I commend the Board for taking that action. I regret, however, that it was started rather belatedly. I have written a letter to the Board expressing my concern and asking it promptly respond to a number of questions about the Bellefonte decision and the nuclear program in general.

Again, Mr. Chairman, if there is anyone in this body I would rather see this question referred to and resolved by, I don't know who it would be. I thank you, Mr. Chairman, for your consideration.

Senator HUMPHREY. Thank you, Senator Denton. We appreciate your participation.

We will now ask Congressman Flipppo from Alabama to share his point of view with us and that of his constituents. Good morning, Congressman.

STATEMENT OF HON. RONNIE G. FLIPPO, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ALABAMA

Mr. FLIPPO. Mr. Chairman, thank you very much. I am grateful for the opportunity to be with you today to express my views.

Mr. Chairman, your committee is certainly to be commended for its interest in this unique regional development agency. Mr. Chairman, because of the relatively small amount of Federal resources that have been devoted to TVA in the past, the agency has really not received the kind of attention nor acclaim that it deserves. Generally, of course, the Congress is too wrapped up in matters which carry a far higher price tag than those associated with TVA.

Mr. Chairman, it is my understanding that the committee has been provided with detailed information about the nature of TVA's activities in recent years. So I will restrict my comments.

From my comments today, Mr. Chairman, some may try to classify me as a critic of TVA. Indeed, from time to time I have had harsh words for managers of TVA. Let there be no misunderstanding, Mr. Chairman, about my position. I endorse completely the

role and the purpose of TVA as a vital tool in achieving important national objectives. My disagreements with the agency's managers are an effort to enhance the ability of TVA to serve the people of the Nation and the region.

The problems I see with TVA are not in its programs or activities, nor in its responsibilities or its charge from Congress, nor even the TVA's execution of its responsibilities, although I and others can find plenty to disagree with in the day-to-day operation of TVA. Many of us in the Valley disagree, both publicly and privately, with TVA decisions about policy and the execution of policy. These disagreements in no way diminish our respect for the accomplishments of TVA and the continuing need for the agency's work as a unified resource development agency.

Mr. Chairman, the basic objectives of TVA were valid when they were assigned by the Congress in 1933 and they are valid today. TVA still has a vital role to play in the development of the region if the fullest potential of the Nation is to be realized.

The agency's difficulties, Mr. Chairman, are reflected in the uneasiness about the ability of TVA to operate the nuclear facilities and the large amount of fines for failures in the nuclear plants, the absence of independent review of electric rate decisions, and the inability of the agency to initiate a review or appeal process outside the management structure which could gain and hold the confidence of the employees. Others involve the employees' expressed fears of reprisal and intimidation on issues of quality assurance and control, and the absence of any statutory system for the citizens of the region to review and comment on policy decisions of the agency prior to the adoption of those policies.

Those kinds of difficulties seem to be a problem of management, more specifically management structure. Management structure is really not a responsibility of TVA, Mr. Chairman; it is the responsibility of Congress and ultimately the responsibility of the people of the region and of the Nation.

TVA's management structure was unique when the agency was established more than 50 years ago and it is unique now.

The uniqueness, vesting responsibility for policy and for the day-to-day execution of that policy, in a three-man Board may have had validity and purpose when TVA was created. I will not attempt to pass judgment on that. I can testify that the management structure was able to accomplish great feats in response to unbelievable national needs during the days of the Great Depression, World War II, and the days following it.

However, many things can change in 50 years, not the least of which is the public's perception of adequate forms of accountability and responsibility.

The people of a democracy such as ours today demand more representative structures of Government, whether it be in the city council or in legislative districts.

Preannouncement of major policy changes and consideration of public views is the norm for almost all agencies of Government. In Government, as well as in publicly owned private corporations, audit procedures and reviews are divorced from the people involved in day-to-day management in almost all organizations except TVA.

In all regions, except TVA, the people have the comfort of knowing that an outside body has the responsibility for review of electric rate changes.

TVA's management, Mr. Chairman, may operate with the wisdom of Solomon. Their policy decisions may be correct and flawless. However correct and proper the decisions may be, they are conceived and made in a process which fails to meet the test of present day statutory standards for notification, hearings and comment periods, and justification. For this, the agency pays a heavy price in lack of credibility.

The operation of the internal audit and appeal procedures within the framework of the management organization, as opposed to an independent inspector general, has so failed to gain the confidence of the employees that an outside firm had to be engaged to listen to allegations of inadequate quality assurance at Watts Bar. For this, TVA and its ratepayers bear a heavy cost in actual outlays as well as in employee moral and productivity.

In my view, many of these TVA problems arise out of the fact that the TVA Board plays two roles—policymaker and manager—making impartial performance review more difficult. This arrangement also makes it more difficult for the agency to convince employees, clients, and customers of the validity and wisdom of its actions when the actions tend to be painful or unpopular.

It seems to me the focus of public concern about TVA should be on making it more responsive to the people, more representative of the region, more accountable for its actions, and thus better understood by those who pay the bills.

A Board, Mr. Chairman, as I am sure you will agree, that is more representative, responsive, accountable and understood will be more effective in dealing with the region's needs, and will, therefore, receive support from the people it serves and represents.

I do appreciate the opportunity to be here today to express my views.

Senator HUMPHREY. Thank you, Congressman.

Are the Members of the House aware there is a vote under way on your side?

Mr. QUILLEN. There is.

Senator HUMPHREY. Let me just say very quickly we are grateful for your testimony, Congressman Flipppo. You have made quite clear your commitment to the fundamental concept of the TVA, and I commend you for your courage and perceptiveness in analyzing a management flaw and having the courage to point it out. I don't have the time now, but I want to consult with you over the next few weeks and see what ideas you have to correct these flaws which I believe you have correctly identified.

Mr. FLIPPO. Thank you for comments and I shall look forward to working with you.

Senator HUMPHREY. Thank you very much.

Next we will hear from Congressman James Quillen.

**STATEMENT OF HON. JAMES H. QUILLEN, A REPRESENTATIVE
IN CONGRESS FROM THE STATE OF TENNESSEE**

Mr. QUILLEN. Thank you, Mr. Chairman and members of the subcommittee. I appreciate this opportunity to appear before you as you conduct these oversight hearings on the Tennessee Valley Authority.

TVA is an oddity in the Federal Government because its headquarters are in the region it serves and not here in Washington. Its managers and policy makers live there, know the people, and see the problems firsthand. Its day-by-day decisions don't have to be sent here for administrative review by someone far removed from the scene.

This avoids at least a part of the various procedures and obstacles that can cause delays and discourage initiative in Government action today.

For example, when serious pollution problems turned up in the Boone Lake in upper east Tennessee, TVA was quickly able to begin determining the amounts and sources of pollution, and in cooperation with others is drafting a plan for water quality management. This plan will identify actions that can be taken by the State, local governments and private landowners to protect water quality.

When local concerns developed about problems of one area's ground water, TVA drew up a demonstration project using that area as a proving ground for approaches that can be used elsewhere. In this demonstration project, TVA is measuring the quality of ground water supplies, identifying the recharging sources, analyzing the land uses that affect ground water quality, and developing ways to safeguard ground water supplies of the future.

This project can serve as a model for many rural areas in the region and nationally where ground water is the basic source for domestic water supplies.

Most current programs dealing with ground water have acted only on an emergency basis, after acute contamination is discovered. More information is needed on how that contamination moves through the soil and finds its way into our underground water supplies and what practical steps can be taken to protect this critically important resource. Because of TVA's long involvement with water resources of the Tennessee Valley, it is in a position to play a valuable role in this national effort.

A cooperates with State agencies in this work. It has a memorandum of understanding with the EPA that defines their respective responsibilities in this field. TVA is a member of the new inter-agency committee organized by EPA to coordinate ground water protection efforts on a national basis.

Other programs have been developed by TVA to help counties and cities in the region object take advantage of opportunities to create jobs. These programs are also successful because TVA specialists and decisionmakers understand the region's local needs. Programs can be tailored to fit these local needs rather than follow standardized criteria drawn up in Washington.

For instance, in Johnson County, TN, my district, a major local industry closed its doors and laid off over 3,400 workers,

adding to a local unemployment level that was already high. When another company was found that was willing to lease and operate that plant, TVA helped the county put together a financial package for acquiring and leasing the property. As a result, 250 jobs were created to soften the blow of this previous plant shutdown.

Mr. Chairman, since there is a vote on in the House, may I ask unanimous consent that my full statement be put in the record. And let my position be well known, I support TVA and I think that the 70-percent cut in this budget for this program is drastic and critical and should not be.

Thank you very much, Mr. Chairman.

Senator HUMPHREY. Thank you, Congressman Quillen. We will put your entire statement in the record. We value your testimony.

We have lost track of who is here and who has gone to vote. Are there any Members of the House present?

All right. We expect Members to return. Therefore, we will recess for the moment.

[Brief recess.]

Senator HUMPHREY. The subcommittee will come to order.

Before we call upon our next witness, I want to enter into the record a statement of the Honorable Bill Hendon [see p. 586], who had planned to be here this morning but whose flight was delayed.

First let me apologize to the Members of the House for delaying them on account of a brief news conference here.

I hope I don't violate any protocol here, but I am told Representative Jim Cooper is the next witness we should call upon.

Mr. COOPER. Mr. Boucher was here before I, so I defer to him.

Senator HUMPHREY. Fine. Representative Rick Boucher from Virginia. Good afternoon.

STATEMENT OF HON. FREDERICK C. BOUCHER, A REPRESENTATIVE IN CONGRESS FROM THE COMMONWEALTH OF VIRGINIA

Mr. BOUCHER. Thank you, Mr. Chairman. At the outset, Mr. Chairman, I would like to request unanimous consent that the statement of Bart Gordon be made a part of the record.

Senator HUMPHREY. Without objection. [See p. 583.]

One of the nice things about a long hearing is you get to run it all yourself after about the first two hours.

Mr. BOUCHER. Mr. Chairman, I appreciate the opportunity to appear before you at today's oversight hearing on the Tennessee Valley Authority.

During this time of high Federal deficits, reviewing the expenditure of Federal funds for TVA is a prudent exercise. I think it is very appropriate that the expenditures of all Federal agencies, including the TVA, be reviewed. In my opinion, the investment the Federal Government makes in the TVA is a wise one. I am pleased to describe today the basis for that view.

TVA's community development program has two important goals. First, to provide a hand up to the economically disadvantaged seven state Tennessee Valley region and, second, conducting valuable research which is of benefit not to just that region but to the entire Nation.

The need for TVA's economic development assistance is evidenced by the region's depressed economy. Other parts of the country are participating in a prosperity which the Tennessee Valley has never enjoyed. The Tennessee Valley has grown much more slowly than the U.S. average since 1979, and as a consequence the economic gap that separates it from the rest of the Nation has widened.

Levels of income in the TVA area are less than 80 percent of the national average and have been diverging from rather than converging towards the national average since the late 1970's. There are about 135,000 more unemployed workers in the Tennessee Valley area today than there were in 1979, with one out of every four counties in the valley having an unemployment rate at least twice as high as the national average. As a result, throughout the Tennessee Valley there has been a renewal since 1980 of the net outmigration of population which characterized that region from the 1940 to 1960 period.

TVA has been of vital assistance to the Valley in making its long transition to participation in the mainstream of American economic life. Back during the era of the Great Depression when the TVA began, the region had very basic problems, such as a predominantly illiterate and unskilled population, lack of industry, inadequate health facilities and water supplies, and an incomplete and treacherous transportation network. The valley has made significant advances since that time but, it still lags substantially behind the rest of the Nation.

TVA's assistance in such areas as waste management, recreation planning and transportation assessment have aided the valley in developing a strong economic base. The increasing urbanization of the nation makes the region's remote mountains and valleys a valued resource, more today than has been the case in the past.

Tourism is emerging as an industry, and TVA has complemented significant local efforts by providing, for example, technical assistance to southwest Virginia communities that converted an abandoned rail right-of-way to a hiking and bicycling trail. The Forest Service is now utilizing TVA's information to convert that portion of the trail under its jurisdiction.

TVA's program are not a handout but a hand up in that they bring the valley into the economic mainstream.

In my opinion, it is somewhat selfish for States which are currently enjoying prosperity to state that they will not help less economically advantaged parts of the country. Not only is such an attitude ungenerous, but it is shortsighted. The economic future of the entire country is well served by reducing remaining problems of economic distress. When these disadvantaged regions thrive, the national treasury more than gets its money back through enhanced revenue and reduced dependence on government assistance.

In addition to addressing the severe economic problems, the TVA also serves the rest of the Nation with its valuable fertilizer research and development program, energy research programs, demonstration projects, and recreation management. It is a testament to TVA's fertilizer research expertise that about three-fourths of domestic fertilizers are made with TVA developed products. Taxpayers throughout the country benefit from the lower food costs re-

sulting from this research. Techniques developed from TVA's research in the areas of recreation, environmental education, and natural resource management have been utilized throughout the United States.

The water-related services TVA provides to the Tennessee Valley are equivalent to services offered to other parts of the country by such federal agencies as the Corps of Engineers and the Bureau of Reclamation. The cost efficiency of TVA's service in this regard is well evidenced by the fact that the per person basis of expenditures for the Bureau of Reclamation was \$10.58 compared to \$9.83 for TVA's water-related functions.

In conclusion, Mr. Chairman, I want to reiterate TVA does not provide purely a regional benefit. It conducts research of national importance and assists the less prosperous Tennessee Valley region. A strong nation, in my opinion, is not one that fails to assist its remaining pockets of underdevelopment. Thanks to TVA, the valley is beginning to stand on its own and develop a solid base for full participation in the mainstream of American economic life.

But that goal has not been fully achieved. With TVA's continued help, that goal is most achievable.

Mr. Chairman, I thank you for the committee's indulgence and for this opportunity to appear today.

Senator HUMPHREY. Thank you, Congressman.

Congressman Jim Cooper from Tennessee. Thank you for coming and thank you for your patience.

STATEMENT OF HON. JIM COOPER, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TENNESSEE

Mr. COOPER. Thank you, Mr. Chairman. It is my pleasure to be with you today. I appreciate your willingness to entertain testimony from so many Members.

Mr. Chairman, it is with a great sense of urgency that I am here today to testify on behalf of adequate funding of the nonpower budget of TVA.

I represent, as you know, the Fourth Congressional District of Tennessee, which, according to the 1980 census, is the 11th poorest congressional district in the States, the 5th most rural, and the 3rd most illiterate. Chronic unemployment ranging between 12 and 20 percent has had a devastating impact on many of my counties, and the current economic recovery is only gradually reaching these areas. Three of my major industries—agriculture, coal and textiles—haven't benefited from the recovery at all.

For over 50 years the TVA has been the leading force for economic development in Tennessee. In many parts of the State it has literally worked miracles. The main problem is that TVA has not had the resources or the time to reach all parts of the valley and to complete the task it was created to do.

TVA has helped my district. I shudder to think what our unemployment rate or our economy would be like without the tourism created by the many TVA lakes, the soil erosion control and flood control that has preserved our land, the fertilizer research that has improved our soils, or the countless economic development initiatives the TVA has taken to attract industry to the State and to

promote economic development in my area. But TVA, regrettably, has not had the resources or the time to complete its job in my district. We need its nonpower budget to be adequately funded so that TVA has that chance.

After such testimony, it may shock you to hear that I am a fiscal conservative, as tight with a taxpayer dollar as anyone who ever hailed from New Hampshire. I have voted and will continue to vote for measures to freeze and to sharply reduce Federal spending in almost all areas. This may well include voting today against the rule and final passage of the House energy and water appropriation bill.

But even in this era of austerity, there is a place, a rightful place, for a TVA with a leaner budget. It too should take its share of the cuts. I am convinced that with improved management, it could take a 10- or 20-percent cut in its nonpower budget and still be able to help lead and improve the valley.

To ask more than this from TVA I feel is unfair to the people of my district who have struggled for years to make a future for themselves and their children on thin soil and steep hills, and far from the so-called boom cities of America.

To agree with the administration that a 70-percent cut is appropriate is in my opinion to gut the agency without having the courage to admit what you are really doing. The enemies of TVA, and there have always been many, are today I feel hiding under the cloak of austerity when their real aim is to kill off the agency. I challenge those whose real desire is to kill off TVA to say what they intend to replace it with and what hope they offer for the people of my district of the valley.

The bottom line, in my opinion, is that TVA is in place, it is working, and it deserves a chance to survive—not for its own sake but for the sake of the people of the Valley.

Thank you, Mr. Chairman. I appreciate the opportunity to testify.

Senator HUMPHREY. Thank you, Congressman. Our pleasure.

Did we miss anyone? A number of Members have been unable to come, and we will be happy to receive their testimony in writing, as well as those who did not originally request to testify. We will keep the record open for 1 week for that purpose.

We will close by observing that we have extended every possible courtesy to Members of both Houses to present their points of view, as we will continue to do throughout these series of hearings.

The subcommittee stands adjourned.

[Whereupon, at 12:38 p.m., the subcommittee was recessed, to reconvene subject to the call of the Chair.]

[Statements submitted for the record follow:]

STATEMENT OF SENATOR JOHN C. STENNIS
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
SUBCOMMITTEE ON REGIONAL AND COMMUNITY DEVELOPMENT
OVERSIGHT HEARINGS ON THE TENNESSEE VALLEY AUTHORITY
JULY 15, 16, AND 30TH, 1985

MR. CHAIRMAN:

I WELCOME THE OPPORTUNITY TO TESTIFY ON BEHALF OF TVA.

AS A PERSON WHOSE PUBLIC CAREER ROUGHLY SPANS THE SAME PERIOD AS THE EXISTENCE OF TVA, I HAVE WITNESSED WHAT THE AGENCY HAS MEANT TO THE PEOPLE OF THE TENNESSEE VALLEY, AND TO THE PEOPLE OF THE UNITED STATES. I HAVE SEEN FIRSTHAND THE GOOD WORK TVA HAS DONE IN THE PAST AND THE GOOD WORK IT IS DOING TODAY.

I RECALL WHAT LIFE WAS LIKE IN THE TENNESSEE VALLEY REGION BEFORE TVA. I'VE BEEN PRIVILEGED TO SEE THE CONTRIBUTIONS TVA HAS MADE TO THE REGION. BUT I SPEAK ON BEHALF OF TVA NOT JUST FOR ITS REGIONAL CONTRIBUTIONS, BUT ALSO FOR ITS NATIONAL CONTRIBUTIONS.

AS A FORMER MEMBER OF THE PUBLIC WORKS COMMITTEE AND AS A FORMER CHAIRMAN OF THE APPROPRIATIONS COMMITTEE FOR PUBLIC WORKS, I BELIEVE THAT I CAN SAY THAT TVA HAS PROMOTED ECONOMIC DEVELOPMENT FOR THE BENEFIT OF EVERYONE. I CAN CLEARLY SEE THAT SOME OF THE GREAT ADVANCES OF THIS COUNTRY COULD NOT HAVE HAPPENED WITHOUT TVA.

AT A TIME WHEN WE ARE ALL CONCERNED ABOUT THE ECONOMY AND WE ARE LOOKING FOR WAYS TO FOSTER GROWTH AND PROSPERITY, I THINK IT'S IMPORTANT TO RECALL SOME OF TVA'S ACCOMPLISHMENTS. I BELIEVE THESE SUCCESSES POINT TO A MODEL THAT COULD BE USED EVEN MORE IN MANY OTHER AREAS OF THE COUNTRY.

- WITH TVA'S HELP, THE NATION'S EIGHTH LARGEST RIVER WAS HARNESSSED, BRINGING AN END TO THE FLOODING THAT PLAGUED THE AREA AND BRINGING ELECTRIC POWER AND INDUSTRIAL WATER TRANSPORT TO ONE OF THE MOST INPOVERISHED AREAS IN THE NATION;
- FERTILIZER PRODUCED AT TVA'S NATIONAL FERTILIZER DEVELOPMENT CENTER HELPED REVITALIZE AND SUSTAIN THE NATION'S FARMLAND;
- AND TVA ELECTRICITY NOT ONLY TURNED ON THE LIGHTS OF TENNESSEE VALLEY HOMES FOR THE FIRST TIME, BUT ALSO SUPPLIED POWER FOR MAKING ALUMINUM METAL FOR THOUSANDS OF AMERICA'S FIGHTER PLANES. THIS SAME ELECTRIC POWER WAS THE REASON FOR THE LOCATION OF THE ATOMIC BOMB FACILITIES AT OAK RIDGE. I REMEMBER SO WELL BEING TOLD BY A MAN ABOUT PEOPLE IN TENNESSEE MAKING SOMETHING AND THEY DIDN'T KNOW WHAT THEY WERE MAKING. THREE OR FOUR DAYS LATER THE ATOMIC BOMB WAS DROPPED.

AT THIS TIME OF PUBLIC SCRUTINY, I THINK IT'S ALSO IMPORTANT TO HIGHLIGHT SOME OF TVA'S CURRENT WORK: IN FERTILIZER RESEARCH AND DEVELOPMENT, AND ECONOMIC AND COMMUNITY GROWTH.

AT A TIME WHEN AMERICA'S ECONOMY FACES STRONG CHALLENGES FROM ABROAD, PRODUCTIVITY ON THE FARM IS FLOURISHING--EVEN THOUGH THE FARMER IS NOT.

SINCE 1934, A FOCAL POINT OF THAT PRODUCTIVITY HAS BEEN THE FERTILIZER PROGRAM CONDUCTED BY TVA'S NATIONAL FERTILIZER DEVELOPMENT CENTER--AMERICA'S ONLY CENTER FOR ALL PHASES OF FERTILIZER RESEARCH AND DEVELOPMENT.

- THE CENTER PIONEERED IN THE CREATION OF MODERN FERTILIZERS;
- THE CENTER DEVELOPED ENERGY-SAVING MANUFACTURING PROCESSES THAT ARE NOW THE INDUSTRY STANDARD.

THESE NEW FERTILIZERS AND NEW FERTILIZER TECHNOLOGIES HAVE REDUCED FARMING COSTS AND INCREASED FARM PRODUCTIVITY. AMERICAN FARMERS HAVE BENEFITED, AND SO HAVE AMERICAN FAMILIES.

BUT THAT'S ONLY PART OF THE STORY. THE CENTER HAS NEVER STOPPED AT PURE SCIENTIFIC RESEARCH. RESULTS IN THE LABORATORY ARE THE INITIAL STEP; RESULTS IN THE FIELD ARE THE ULTIMATE GOAL.

- THE FERTILIZER CENTER WORKS TOGETHER WITH UNIVERSITIES, THE EXTENSION SERVICES, AND FARMERS TO ORGANIZE TEST DEMONSTRATION PROJECTS: OVER 78,000 FARMS ACROSS THE COUNTRY HAVE TAKEN PART OVER THE YEARS;
- THE FERTILIZER CENTER HAS BEEN VERY SUCCESSFUL IN TRANSFERRING ITS TECHNOLOGY TO PRIVATE FERTILIZER COMPANIES. TO DATE, THE NFDC HAS OBTAINED OVER 250 PATENTS--OVER 70% OF ALL THE PATENTS IN THIS SCIENTIFIC FIELD, AND ITS DISCOVERIES ARE LICENSED FOR USE BY NEARLY 400 COMPANIES WITH 597 FERTILIZER PLANTS.
- AN ESTIMATED 75% OF TODAY'S FERTILIZERS ARE MADE WITH TECHNOLOGY THAT ORIGINATED AT THE TVA CENTER.

THE FERTILIZER CENTER PAYS NATIONAL DIVIDENDS IN FARM PRODUCTIVITY--AN ESTIMATED TOTAL -- PROJECTED TO 1990 -- OF OVER \$57 BILLION DOLLARS. THIS AMOUNTS TO A RETURN OF \$20.50 FOR EACH PUBLIC DOLLAR INVESTED. BUT ITS BENEFITS EXTEND BEYOND DOLLARS AND CENTS TO THE NATION'S FUTURE WELL-BEING AND SECURITY.

WHEN THE CENTER WAS ESTABLISHED A HALF-CENTURY AGO, AMERICA DEPENDED ON FOREIGN SOURCES OF FERTILIZER TECHNOLOGY. THANKS TO THE WORK OF THE FERTILIZER CENTER, THE WORLD'S PRINCIPAL CENTER OF FERTILIZER TECHNOLOGY, THE U.S. IS NOW AT THE FOREFRONT OF FERTILIZER RESEARCH AND DEVELOPMENT. ALSO, THE FOREIGN FERTILIZER INDUSTRY IS RELYING MORE ON TVA'S INNOVATIONS THAN ON ITS OWN.

IT IS CLEAR TO ME THAT THIS RESEARCH SHOULD CONTINUE. WE SHOULD, FOR OUR NATION'S SECURITY, CONTINUE TO STAY AHEAD IN THIS CRITICAL TECHNOLOGY. TO CRIPPLE TVA'S NATIONAL EFFORTS AT THE FERTILIZER CENTER WITH EXCESSIVE BUDGET CUTS IS TO CRIPPLE THE FUTURE PRODUCTIVITY OF AMERICA'S FARMS AND FORESTS. I CAN ASSURE YOU THE IMPACT WILL REACH FAR BEYOND THE TENNESSEE VALLEY REGION AND WILL EXTEND FAR BEYOND FISCAL YEAR 1986.

IN THE AREA OF RURAL ECONOMIC DEVELOPMENT, I DEEPLY BELIEVE THAT SUSTAINING THE FERTILITY AND PRODUCTIVITY OF THE LAND WILL BE A MAIN SOURCE OF THE NATION'S FUTURE STRENGTH AND WELL-BEING. IN THIS REGARD THE TENNESSEE VALLEY AUTHORITY HAS OVER THE YEARS DEVELOPED A PROGRAM FOR ECONOMIC DEVELOPMENT WHICH ALLOWS THE RURAL COUNTIES OF THE TENNESSEE VALLEY REGION TO REALIZE THEIR ECONOMIC POTENTIAL. THIS PROGRAM NOT ONLY HELPS THE PEOPLE WHO LIVE THERE, BUT ALSO AFFECTS THE VITALITY OF THE NATIONAL ECONOMY AS WELL.

THESE RURAL PEOPLE ARE NOT ASKING FOR A HANDOUT. BUT THEY NEED THE SPECIALIZED HELP AND GUIDANCE TVA'S RURAL ECONOMIC AND COMMUNITY DEVELOPMENT PROGRAM PROVIDES.

WE WILL ALSO GET PEOPLE PAYING FEDERAL TAXES INSTEAD OF RELYING ON TRANSFER PAYMENTS. A DOUBLE-BARRELLED BENEFIT IN TERMS OF CUTTING THE FEDERAL DEFICIT.

ON A PREVIOUS OCCASION, I SAID OF TVA'S ECONOMIC AND COMMUNITY DEVELOPMENT PROGRAMS THAT "I DON'T KNOW OF ANY INVESTMENT ANYWHERE IN AMERICA THAT IS TURNING MORE BENEFITS, LASTING BENEFITS FOR THE PEOPLE, THE LITTLE PEOPLE" OF THIS COUNTRY. I STAND BY THAT STATEMENT.

TVA'S PROGRAMS HAVE A PROVEN RECORD IN THE CREATION OF JOBS. THEIR PROGRAMS WORK. TO GIVE JUST A FEW EXAMPLES OF WHAT I MEAN, I CITE THE FOLLOWING EXAMPLES:

- TVA'S EXISTING INDUSTRIES PROGRAM, DESIGNED TO ASSIST SMALL- AND MEDIUM-SIZED FIRMS PLANNING FOR EXPANSION, BEGAN ONLY TWO YEARS AGO WITH ONE COMPANY. TO DATE IT HAS WORKED WITH 290 FIRMS TO HELP CREATE MORE THAN 10,000 NEW JOBS;
- TVA'S SPECIAL OPPORTUNITIES COUNTIES AND CITIES PROGRAM, DESIGNED TO ASSIST THE REGION'S 50 MOST ECONOMICALLY-DISTRESSED COUNTIES, HAS GENERATED 6,300 NEW JOBS AND \$70 MILLION OF ADDITIONAL PUBLIC AND PRIVATE INVESTMENT;
- LAST YEAR TVA'S SKILLS DEVELOPMENT PROGRAM HELPED TRAIN AND PLACE MORE THAN 11,000 PEOPLE IN PRIVATE SECTOR JOBS PAYING AN AVERAGE STARTING WAGE OF \$8 PER HOUR. THIS WILL ADD ABOUT \$121 MILLION IN ANNUAL WAGES TO THE REGION'S ECONOMY.

THESE JOB-CREATING PROGRAMS ARE OPERATING ON A MODEST ANNUAL BUDGET. IN 1985 IT IS ESTIMATED THAT THESE PROGRAMS WILL SPEND \$22 MILLION DOLLARS. THEY'RE CAREFULLY TARGETED TO MEET THE ECONOMIC NEEDS OF THE REGION. THEY'RE FRUGALLY FUNDED. THEY EMPHASIZE TECHNICAL ASSISTANCE RATHER THAN MONEY GRANTS. THEY PROVIDE SMALL AMOUNTS OF SEED MONEY ONLY AS A MEANS TO SET IN PLACE A FRAMEWORK FOR LASTING ECONOMIC PROGRESS.

I'VE SEEN FIRSTHAND WHAT THIS ASSISTANCE HAS MEANT TO MISSISSIPPI AND TO THE TENNESSEE VALLEY REGION. THESE PUBLIC AND PRIVATE PARTNERSHIP EFFORTS DON'T GIVE THE REGION AN UNDUE ADVANTAGE, BUT HELP DRAW IT CLOSER TO THE NATION'S ECONOMIC MAINSTREAM. THE TENNESSEE VALLEY REGION BENEFITS, BUT SO DOES THE REST OF THE COUNTRY.

THE ADMINISTRATION'S PROPOSAL TO CUT THE BUDGET OF THE TENNESSEE VALLEY AUTHORITY BY SOME 70% AMOUNTS TO A MULTIMILLION-DOLLAR TAX INCREASE FOR RESIDENTS OF ONE OF THE NATION'S POOREST REGIONS.

THE PLAN, URGED BY THE OFFICE OF MANAGEMENT AND BUDGET, WOULD BE LEGISLATION-BY-DEFUNDING, ENDING TVA'S REGIONAL-DEVELOPMENT MISSION, SET OUT IN THE 1933 LEGISLATION THAT CREATED THE AUTHORITY, AND REDUCING THE OPERATION OF TVA TO MERE POWER-GENERATION.

THE PROPOSED CHANGE, IF NOT STOPPED BY CONGRESS, WOULD BE A SERIOUS MISTAKE. THE WORK IS NOT FINISHED. THERE IS GREAT POTENTIAL FOR FURTHER GROWTH IN THE AREA. WE ARE PROUD THAT PERSONAL INCOME IN THE REGION HAS GROWN FROM 40 PERCENT TO 80 PERCENT OF THE NATIONAL AVERAGE, BUT CLEARLY WE SHOULD NOT STOP THIS WORK UNTIL THE JOB IS DONE.

THE ADMINISTRATION PROPOSES THAT CONGRESS CUT TVA'S BUDGET FROM THE CURRENT \$129.5 MILLION -- ALREADY DOWN 40 PERCENT SINCE 1980 -- TO JUST \$38.6 MILLION. THE ONLY SURVIVING TVA PROGRAM NOT DIRECTLY TIED TO POWER-RELATED ACTIVITIES WOULD BE THE AUTHORITY'S FERTILIZER RESEARCH AND DEVELOPMENT CENTER IN MUSCLE SHOALS, ALABAMA, AND IT WOULD BE SHARPLY CURTAILED.

ELIMINATED WOULD BE ECONOMIC DEVELOPMENT (AND TAX-GENERATING) ACTIVITIES.

THE PEOPLE WHO BENEFIT FROM THESE TVA PROGRAMS PAY BACK VIRTUALLY DOLLAR-FOR-DOLLAR FOR THE FUNDS THEY RECEIVE FROM WASHINGTON FOR ECONOMIC DEVELOPMENT. TVA'S ELECTRICITY-GENERATING OPERATIONS DELIVER AN ANNUAL PROFIT OF ABOUT \$120 MILLION TO THE FEDERAL BUDGET. IN ADDITION, THE TAXES FROM THE JOBS CREATED BY TVA PROGRAMS RETURN MORE FUNDS THAN THOSE EXPENDED. I KNOW THAT THESE HUGE BUDGET DEFICITS THAT CONFRONT THE NATION ARE CAUSE FOR CONCERN AND CHALLENGE US ALL TO LOOK FOR SAVINGS WHEREVER POSSIBLE, BUT IT WOULD BE UNSOUND AND UNWISE TO REDUCE THE TVA BUDGET, AS HAS BEEN PROPOSED.

ENACTMENT OF THIS BUDGET PLAN COULD FINALLY CARRY OUT, THROUGH BUDGET REDUCTION, THE GOAL THAT OPPONENTS HAVE STUCK TO EVER SINCE TVA WAS CREATED: DISMANTLING THE PROJECT. THE BUDGET CUT WOULD STOP SHORT OF THAT, BUT WITH TVA SHORN OF NEARLY ALL OF ITS ECONOMIC DEVELOPMENT ACTIVITIES, IT WOULD BE A SHORT-STEP TO ARGUING THAT SINCE IT HAD BECOME ONLY A POWER COMPANY, TVA SHOULD BE SOLD TO THE PRIVATE SECTOR.

CONGRESSES FOR 50 YEARS HAVE UNDERSTOOD THAT TVA IS NOT JUST, AND IN FACT IS NOT EVEN MAINLY, A POWER-GENERATING AGENCY. THE POWER PRODUCTION WAS INCIDENTAL TO FLOOD CONTROL, WHICH WAS ONE OF THE BASICS OF THE AGENCY'S MISSION -- REGIONAL DEVELOPMENT. TVA'S JOB IS NOT DONE, AND TVA SHOULD NOT BE UNDONE. TVA IS A NATIONAL ASSET -- AN ORGANIZATION OF TALENTED PEOPLE. IT SHOULD BE USED TO ITS FULLEST TO CONTINUE TO HELP THE NATION.

JCJ:LHW

TESTIMONY OF SENATOR JIM SASSER

SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
SUBCOMMITTEE ON REGIONAL AND COMMUNITY DEVELOPMENT

JULY 16, 1985

MR. CHAIRMAN, I'M HAPPY TO BE ABLE TO ADDRESS THIS COMMITTEE ON THE SUBJECT OF THE TENNESSEE VALLEY AUTHORITY, AND I WELCOME THE OPPORTUNITY AFFORDED BY THESE HEARINGS TO EVALUATE THE CONTRIBUTIONS TVA IS MAKING TO THE TENNESSEE VALLEY AND TO THE ECONOMIC WELL-BEING OF THE NATION AS A WHOLE.

AS A MEMBER OF THE SUBCOMMITTEE ON ENERGY AND WATER APPROPRIATIONS, I HAVE PARTICIPATED IN AND CHAIRED NUMEROUS OVERSIGHT HEARINGS ON TVA POWER AND NON-POWER PROGRAMS. IN ADDITION, I URGED THE GENERAL ACCOUNTING OFFICE TO ESTABLISH A BRANCH IN KNOXVILLE WHICH HAS PROVIDED CONGRESS WITH CONTINUED OVERSIGHT OF TVA OPERATIONS.

ON SEVERAL RECENT OCCASIONS, I HAVE BEEN A CRITIC OF TVA. CERTAINLY WHEN TVA WAS ANNOUNCING DOUBLE DIGIT RATE INCREASES REGULARLY DURING THE LATE '70s, I WAS AT THE FOREFRONT OF ATTEMPTS TO INCREASE TVA'S ACCOUNTABILITY AND RESPONSIVENESS.

I BELIEVE WE WERE SUCCESSFUL IN THOSE EFFORTS. THE RECORD WILL SHOW THAT TVA TOOK GENUINE STRIDES FORWARD IN RESPONSE TO THE INVESTIGATIONS I ASKED THE GAO TO PERFORM.

MOREOVER, THE PERIOD OF RADICAL TVA RATE INCREASES HAS ABATED IN RECENT YEARS AND TVA'S AVERAGE RESIDENTIAL POWER RATE IS ONCE AGAIN ONE OF THE LOWEST IN THE COUNTRY.

OBVIOUSLY, TVA STILL HAS ITS PROBLEMS. THE NUCLEAR PROGRAM CONTINUES TO DEMAND CAREFUL SCRUTINY. AND TVA'S ECONOMIC DEVELOPMENT EFFORTS MUST BE OVERSEEN BY A VIGILANT CONGRESS.

BUT WHEN WE START TALKING ABOUT STRUCTURAL CHANGE, WE MUST BE VERY CAREFUL INDEED. TAMPERING WITH LEGISLATION THAT HAS BEEN PRODUCTIVE FOR 52 YEARS CAN POSE VERY REAL PROBLEMS. THERE IS ALWAYS THE DANGER THAT THE MEDICINE MAY BE FAR MORE DESTRUCTIVE THAN THE DISEASE.

I BELIEVE WE MUST CONSULT VERY CLOSELY WITH THE PEOPLE OF THE TENNESSEE VALLEY STATES BEFORE WE PERFORM RADICAL SURGERY ON TVA.

MR. CHAIRMAN, I KNOW--FROM FIRSTHAND EXPERIENCE--THE VALUE OF TVA'S EFFORTS.

IT IS MY HOPE THAT THESE HEARINGS WILL CONCENTRATE ON AN OBJECTIVE ESTIMATE OF THAT VALUE. THE ISSUE BEFORE US IS NOT AN ABSTRACT QUESTION OF IDEOLOGY. IT IS A QUESTION OF PRACTICAL RESULTS.

DO THE FEDERAL DOLLARS SPENT ON TVA'S NATURAL RESOURCE AND ECONOMIC DEVELOPMENT PROGRAMS PAY DIVIDENDS IN THE TENNESSEE VALLEY AND DO THEY REPRESENT A PRUDENT INVESTMENT FOR THE TAXPAYER?

THAT IS THE ISSUE, MR. CHAIRMAN. I BELIEVE--AND I THINK A FAIR EXAMINATION OF THE RECORD WILL CONFIRM--THAT TVA'S REGIONAL DEVELOPMENT PROGRAMS STAND UP VERY WELL UNDER THE ONLY TEST THAT MATTERS--"THE PRACTICAL TEST"--THE TEST THAT MEASURES CONCRETE, POSITIVE RESULTS FOR THE TENNESSEE VALLEY REGION AND THE COUNTRY.

THE EXTRAORDINARY DEFICITS OF RECENT YEARS HAVE CAUSED ALL OF US TO INTENSIFY THE DEGREE OF CRITICAL SCRUTINY WE DEVOTE TO ALL FEDERAL AGENCIES AND ALL FEDERAL PROGRAMS. I SHARE THIS COMMITTEE'S CONCERN THAT FEDERAL EXPENDITURES BE REDUCED TO THE MINIMUM INVESTMENT THAT IS CONSISTENT WITH MAINTAINING ABSOLUTELY NECESSARY FEDERAL INITIATIVES.

BUT I CANNOT ACCEPT THE PROPOSITION THAT EFFECTIVE GOVERNMENT PROGRAMS SHOULD SUFFER RADICAL AMPUTATION BECAUSE THEY DON'T FIT INTO THE NARROW DEFINITION OF PHILOSOPHICAL ACCEPTABILITY THAT IS CURRENT IN THE OFFICE OF MANAGEMENT AND BUDGET.

THE GREAT MAJORITY OF TVA PROGRAMS PRODUCE TANGIBLE BENEFITS. THEY PAY BACK TO THE NATION WHAT THEY TAKE OUT OF THE TREASURY--AND THEN SOME.

IN THAT REGARD, WE SHOULD CONSIDER THE SYSTEM OF DAMS, LOCKS AND POWER PLANTS BUILT IN THE TVA REGION WITH FEDERAL DOLLARS DURING TVA'S FIRST 25 YEARS. IT IS A COMMONLY HELD MISCONCEPTION THAT TVA'S POWER PROGRAM IS FEDERALLY SUBSIDIZED. THAT IS FAR FROM THE CASE.

IN 1984, THE POWER CONSUMERS OF THE TENNESSEE VALLEY PUT \$113 MILLION BACK INTO THE FEDERAL TREASURY--VERY NEARLY THE SAME AMOUNT INVESTED BY THE GOVERNMENT IN TVA'S REGIONAL DEVELOPMENT PROGRAMS.

AS THE TVA BOARD TESTIFIED YESTERDAY, THAT AMOUNT REPRESENTED A \$20 MILLION REPAYMENT ON THE TREASURY'S INVESTMENT AND \$93 MILLION IN INTEREST--INTEREST THAT HAS BEEN COMPUTED AT THE CURRENT COST OF MONEY TO THE U.S. TREASURY. THOSE PAYMENTS HAVE GONE ON FOR MANY YEARS AND THEY WILL CONTINUE--WITH INTEREST--FOR MANY YEARS TO COME.

I THINK IT IS IMPORTANT FOR THIS COMMITTEE TO RECOGNIZE THAT THOSE DIRECT RETURNS TO THE TREASURY ARE ACCUMULATING IN ADDITION TO THE BENEFITS THAT HAVE BEEN CREATED FOR 52 YEARS BY THE POWER SYSTEM, THE FLOOD CONTROL AND NAVIGATION SYSTEM, AND THE RECREATIONAL FACILITIES PUT IN PLACE BY TVA.

THE ECONOMIC BENEFITS THAT HAVE GROWN OUT OF THAT INFRASTRUCTURE--IN TERMS OF INCREASED RIVER COMMERCE AND GENERALLY INCREASED ECONOMIC ACTIVITY--THOSE ECONOMIC BENEFITS HAVE CONTRIBUTED IMMENSELY TO THE ECONOMIC VITALITY OF THIS COUNTRY IN THE POST WORLD WAR II ERA.

IT IS MY CONTENTION, MR. CHAIRMAN, THAT TVA'S REGIONAL RESOURCE MANAGEMENT PROGRAMS ALSO RETURN--TO THE NATION'S ECONOMY AND TO ITS RESERVOIR OF KNOWLEDGE ABOUT NATURAL RESOURCE MANAGEMENT--BENEFITS THAT FAR EXCEED THE VALUE OF THE TVA'S ANNUAL APPROPRIATION.

YESTERDAY, THE TVA BOARD OFFERED A NUMBER OF EXAMPLES OF THAT RETURN ON INVESTMENT. I WOULD LIKE TO DWELL ON JUST A FEW OF THEM.

FIRST, IN THE AREA OF BALANCING ENERGY PRODUCTION NEEDS AGAINST ENVIRONMENTAL CONCERNS, TVA HAS ESTABLISHED ITSELF AS A RECOGNIZED STANDARD OF JUDGMENT, OF DATA, AND OF PERFORMANCE.

FROM ITS EARLIEST YEARS, TVA HAS SERVED AS A "YARDSTICK" UTILITY FOR THE NATION. AS A PUBLICLY OWNED POWER PRODUCER, IT PROVIDED, FOR DECADES, A BENCH-MARK ELECTRICITY RATE AGAINST WHICH THE RATES OF INVESTOR-OWNED UTILITIES COULD BE MEASURED FOR FAIRNESS AND EQUITY.

TODAY, TVA IS STILL SERVING THAT YARDSTICK FUNCTION, BUT THIS TIME IT IS DOING SO IN AN AREA THAT IS EVEN MORE COMPLEX AND POTENTIALLY MORE CONTROVERSIAL THAN THE AREA OF POWER RATES.

THROUGH THE LAST 6 YEARS, TVA HAS INVESTED \$1 BILLION IN ENVIRONMENTAL CLEAN-UP, REDUCING THE SULFUR EMISSIONS OF ITS COAL-FIRED PLANTS BY MORE THAN 1 MILLION TONS PER YEAR. IN SO DOING, TVA HAS DEMONSTRATED FOR THE NATION THAT COMPLIANCE WITH AIR QUALITY LAWS CAN BE ACHIEVED AT A REASONABLE PRICE TO POWER CONSUMERS.

THAT DEMONSTRATION HAS ESTABLISHED ITSELF AS A CRUCIAL MODEL DURING THE NATIONAL ACID RAIN DEBATE. WITH THE COMPETING CLAIMS OF ENVIRONMENTALISTS AND UTILITIES ABOUT THE COSTS AND CONSEQUENCES OF FURTHER SULFUR CONTROL LEGISLATION, IT IS INVALUABLE TO HAVE, AS A STANDARD, A UTILITY THAT HAS CLEANED UP ITS ACT AND KNOWS--FROM EXPERIENCE--HOW MUCH EMISSION CONTROL WILL COST.

WE HAVE TVA'S DATA. WE HAVE A RECORD OF THE METHODS AND TECHNOLOGIES TVA USED TO PERFORM THE LARGEST SULFUR DIOXIDE CLEAN-UP IN THE NATION'S HISTORY. WE ALSO HAVE TVA'S CLEARLY ARTICULATED STAND ON THE NEED FOR ACID RAIN CONTROL.

THOSE ARE NATIONAL RESOURCES. THEY GROW DIRECTLY OUT OF TVA'S COMMITMENT TO ENVIRONMENTAL CONSCIOUSNESS, AND OUT OF THE POOL OF ENVIRONMENTAL EXPERTISE THAT TVA HAS GATHERED IN ITS OFFICE OF NATURAL RESOURCES AND ECONOMIC DEVELOPMENT.

TO ELIMINATE TVA'S INVOLVEMENT IN ENVIRONMENTAL RESEARCH WOULD THEREFORE DEPRIVE THE COUNTRY OF NECESSARY INFORMATION AND A UNIQUE UTILITY MODEL AT A CRUCIAL TIME OF DECISION ABOUT OUR AIR QUALITY LAWS.

SOMETHING SIMILAR WOULD HAPPEN IF WE ELIMINATE TVA'S INVOLVEMENT IN SOIL EROSION CONTROL. SINCE 1979, TVA HAS WORKED COOPERATIVELY WITH STATE GOVERNMENTS AND THE DEPARTMENT OF AGRICULTURE TO COMBAT SOIL EROSION IN WEST TENNESSEE WHERE EROSION RATES HAD REACHED UPWARDS OF 20 TONS PER ACRE PER YEAR IN SOME COUNTIES.

THE TVA EFFORTS IN WEST TENNESSEE--ONE OF THE WORST SOIL EROSION AREAS IN THE COUNTRY--WERE SO SUCCESSFUL THAT AGRICULTURE SECRETARY BLOCK SUPPORTED THEIR EXPANSION INTO THE NATION'S ONLY REGION-WIDE APPROACH TO SOIL EROSION CONTROL.

TVA'S INITIATIVES HAVE HELPED PROMOTE CORRECTIVE PRACTICES THAT ARE REDUCING EROSION BY AN AVERAGE OF 4 TONS PER ACRE PER YEAR IN SEVERELY AFFECTED AREAS.

HERE AGAIN TVA'S WORK CAN BE A STANDARD. THE PREVENTATIVE METHOD NOW BEING PRACTICED IN THE VALLEY STATES CAN PROVIDE A NATIONAL MODEL AT A TIME WHEN THE DEPARTMENT OF AGRICULTURE IS WORKING OUT A NATIONAL SOIL EROSION POLICY WHICH MAY HAVE TO

INCLUDE PUNATIVE MEASURES AGAINST FARMERS WHO CULTIVATE EROSION SOILS.

TVA IS ALSO PROVIDING NATIONAL LEADERSHIP IN THE AREA OF ADAPTING EDUCATIONAL RESOURCES TO THE NEEDS OF INDUSTRY AND THE REQUIREMENTS OF THE CHANGING JOB MARKET.

THE TUPELO MODEL FOR CAREER EDUCATION IS DESIGNED TO ENCOURAGE COORDINATION BETWEEN EDUCATIONAL INSTITUTIONS AND INDUSTRY IN ORDER TO ASSURE THAT SCHOOLS ARE PROVIDING YOUNG PEOPLE WITH THE SKILLS THAT WILL BE IN DEMAND. THE MODEL HAS WORKED WELL IN THE TUPELO AREA AND IS NOW BEING TRIED OUT IN CHATTANOOGA, TENNESSEE.

AT A TIME WHEN RAPID STRUCTURAL CHANGE IN OUR ECONOMY IS CAUSING RADICAL DISLOCATION WITHIN OUR WORKFORCE, PROGRAMS OF THIS KIND ARE CRUCIAL. THEY INSURE THAT PEOPLE WILL HAVE THE NECESSARY SKILLS TO FIND JOBS, AND THEY HELP OUR INDUSTRIES REMAIN COMPETITIVE IN THE WORLD MARKETPLACE.

MR. CHAIRMAN, I COULD EASILY EXTEND THIS LIST OF PRODUCTIVE TVA VENTURES TO INCLUDE FERTILIZER RESEARCH, STRIP-MINE RECLAMATION, WATER QUALITY ASSESSMENT, AND A WHOLE RANGE OF OTHER INITIATIVES THAT PRODUCE IMMEDIATE REGIONAL BENEFITS AND HAVE LONG-TERM NATIONAL APPLICATION. BUT THE POINT IS ALREADY CLEAR.

PROGRAMS OF THIS KIND CANNOT--FROM ANY FAIR PERSPECTIVE--BE CONSIDERED SUBSIDIES OR PAROCHIAL EXPENDITURES. THEY ARE INNOVATIVE AND PRODUCTIVE. THEY ARE NATIONAL IN THEIR POSITIVE IMPACT. IN MANY CASES, THEY ARE UNIQUE IN THIS COUNTRY.

NOTHING QUITE LIKE LAND BETWEEN THE LAKES EXISTS IN THE EASTERN HALF OF THE UNITED STATES. VERY FEW RESEARCH INSTITUTES HAVE HAD THE SUCCESS ACHIEVED BY TVA'S NATIONAL FERTILIZER RESEARCH CENTER IN PUSHING NEW PRODUCTS INTO THE MARKETPLACE.

NO OTHER ENTITY--PUBLIC OR PRIVATE--HAS ENTERED THE FIELD OF ENERGY PRODUCTION WITH SO KEEN A SENSE FOR ENVIRONMENTAL CONSEQUENCES AS TVA HAS SHOWN IN RECENT YEARS.

THE LOSS OF THESE EFFORTS WOULD NOT BE SIMPLY A REGIONAL LOSS. IT WOULD BE A NATIONAL AND--I THINK IT'S FAIR TO SAY--AN INTERNATIONAL LOSS.

THE TVA MODEL STILL SERVES--FOR DEVELOPING NATIONS THROUGHOUT THE WORLD--AS AN EMBLEM OF THE FLEXIBILITY, THE INGENUITY, AND THE VISION OF AMERICAN GOVERNMENT. NO SIMPLE ACCOUNTING CAN MEASURE THE VALUE OF THAT LEGACY TO AMERICA'S INTERNATIONAL REPUTATION.

MR. CHAIRMAN, WE CANNOT AFFORD TO ABANDON THAT LEGACY. AS I SAID AT THE OUTSET, THE ISSUE IS NOT AN ABSTRACT ONE. IT IS NOT A QUESTION OF IDEOLOGY OR PHILOSOPHICAL PURITY. IT IS, QUITE SIMPLY, A QUESTION OF WHAT WORKS.

FIFTY TWO YEARS OF EXPERIENCE HAVE CONFIRMED THAT THE TVA ACT WORKS.

MR. CHAIRMAN, WE SHOULD EXERCISE EXTREME CAUTION BEFORE CHANGING THE FRAMEWORK OF AN EXPERIMENT IN GOVERNMENT THAT HAS BEEN SUCCESSFUL FOR MORE THAN A HALF CENTURY.

STATEMENT OF HOWARD BAKER

MR. CHAIRMAN, MEMBERS OF THE COMMITTEE, GOOD AFTERNOON. LET ME SAY AT THE OUTSET THAT I HAVE A RATHER DEEP FEELING OF PRIDE AND RESPECT IN APPEARING BEFORE THIS DISTINGUISHED COMMITTEE AS A PRIVATE CITIZEN.

AS I SEE IT, TVA IS A DEMONSTRATION IN METHODS OF INTEGRATED RESOURCE DEVELOPMENT THAT HAVE BEEN CARRIED OUT IN A SPECIFIC REGION, BUT WITH RESULTS THAT ARE AVAILABLE TO THE ENTIRE NATION AND STUDIED BY PEOPLE ALL OVER THE WORLD.

TVA'S REPUTATION EXTENDS FAR BEYOND THE BOUNDARIES OF THE STATES IT SERVES, AND EVEN BEYOND THE BORDERS OF OUR NATION. WHEN I TRAVEL ABROAD I FIND THAT THE NAME AND WORK OF THE TENNESSEE VALLEY AUTHORITY ARE WIDELY RECOGNIZED.

AS A NATIVE TENNESSEAN AND A FORMER MEMBER OF THE U.S. SENATE, I DERIVE A CERTAIN AMOUNT OF PRIDE AND SATISFACTION FROM THAT, BECAUSE TVA TRULY DOES HAVE A A WORLD-CLASS REPUTATION. IT HAS AND WILL CONTINUE TO HAVE AN EVOLUTIONARY MISSION IN MAKING THIS NATION OF OURS A BETTER PLACE TO LIVE.

YOU HAVE ALREADY HEARD FROM THE TVA BOARD ABOUT THE ORGANIZATION'S ACCOMPLISHMENTS. AND I THINK IT'S IMPORTANT TO UNDERTAKE THESE HEARINGS ON TVA'S APPROPRIATE ROLE AND RESPONSIBILITY IN TODAY'S AMERICA. THIS IS ESPECIALLY TRUE IN THESE DAYS OF ESSENTIAL REVIEW OF GOVERNMENT SPENDING AND THE FEDERAL DEFICIT.

YOU MAY DISCOVER, AS I HAVE, THAT TVA IS A SUCCESSFUL DEVICE FOR THE DEVELOPMENT OF OUR HUMAN AND NATURAL RESOURCES. IT BEGAN AS A NEW APPROACH TO HELP DO OLD JOBS BETTER--ONE WHICH HAS BROUGHT GREATER ECONOMIC STRENGTH TO THE TENNESSEE VALLEY AND THE NATION.

I HOPE THAT THIS REVIEW OF TVA CAN LOOK BEYOND THE IMMEDIATE CONCERNS OF THE NATION AND REGION, AND RECOGNIZE THAT AMERICA CONTINUES TO FACE SOME FUNDAMENTAL QUESTIONS THAT ARE NOT YET RESOLVED--IN SUCH AREAS AS ENERGY SUPPLY, ENVIRONMENTAL CONCERNS, AND FINDING EFFECTIVE WAYS TO IMPROVE THE OVERALL QUALITY OF LIFE.

TVA HAS A SPECIAL VALUE TO THE NATION IN TRYING TO DETERMINE HOW TO DEAL WITH THESE KINDS OF BASIC, LONGTERM ISSUES. WHILE TVA MAY NOT FIT VERY NEATLY INTO AN ORGANIZATION CHART OF THE FEDERAL GOVERNMENT, ITS UNIQUE CHARACTERISTICS GIVE US SOME SPECIAL INSIGHTS INTO THESE ISSUES.

TVA HAS ONE FOOT IN THE COURSE OF PUBLIC SERVICE, THE OTHER IN THE PRACTICAL REALITIES OF THE BUSINESS WORLD AS IT WORKS TO OPERATE A LARGE POWER SYSTEM EFFICIENTLY. ON ISSUES WHERE THE VIEWS OF BUSINESS AND GOVERNMENT SOMETIMES COLLIDE, TVA MUST TRY TO RESOLVE THE SAME CONFLICTS IN MAKING ITS OWN POLICY DECISIONS.

WHEN THOSE DECISIONS ARE SUCCESSFUL, THEY CAN HELP THE NATION SOLVE THE SAME KINDS OF QUESTIONS ELSEWHERE. AND IN ANY CASE, THE STRUGGLE ITSELF OFFERS A MICROCOSM OF THE POSSIBILITIES AND PITFALLS THE NATION FACES IN ADDRESSING THE SAME PROBLEMS ON A WIDER SCALE.

VIGOROUS DEBATES HAVE TAKEN PLACE DURING THE PAST 20 YEARS OVER WHAT CONSTITUTES A PROPER BALANCE BETWEEN ENERGY AND ENVIRONMENTAL NEEDS. TVA HAS BEEN INVOLVED IN THAT DEBATE AT THE SAME TIME IT HAS HAD THE RESPONSIBILITY OF WORKING OUT THE PRACTICAL DETAILS OF PROVIDING ENERGY AND PROTECTING THE ENVIRONMENT.

A CASE IN POINT HAS BEEN THE QUESTION OF CONTROLLING AIR POLLUTION FROM LARGE POWER PLANTS BURNING COAL. TVA WAS INVOLVED IN SOME OF THE EARLY RESEARCH, WITH THE FOREST SERVICE AND OTHERS, THAT HELPED DEFINE THIS PROBLEM.

HOWEVER, BY THE EARLY 1970'S THE ELECTRIC POWER INDUSTRY FACED STRONG PUBLIC OPPOSITION TO RAPID INCREASES IN POWER COSTS AND RATES. POWER COMPANIES OPPOSED POLLUTION CONTROL

MEASURES THEY FELT WERE TOO EXPENSIVE, AND TVA'S STANCE WAS MUCH THE SAME--NOT A COMFORTABLE POSITION FOR A NATURAL RESOURCE AGENCY.

EVENTUALLY A COMPROMISE COMPLIANCE PLAN WAS WORKED OUT FOR TVA POWER PLANTS THAT WAS ACCEPTABLE TO EPA, CITIZEN ORGANIZATIONS, AND TVA. IT WAS HAILED NATIONALLY AS A MODEL FOR INDUSTRY IN COMPLYING WITH THE CLEAN AIR ACT. TVA HAS CONTINUED TO HAVE AN IMPORTANT ROLE IN THIS AREA WITH THOUGHT-PROVOKING POSITIONS ON THE ACID RAIN ISSUE.

THROUGH THAT PERIOD TVA SOMETIMES SEEMED TO BE WEARING ITS POWER SYSTEM AND CONSUMER INTEREST HAT, AND AT OTHER TIMES ITS ENVIRONMENT AND NATURAL RESOURCES HAT. BUT THAT REFLECTED THE NATIONAL STRUGGLE THAT WAS UNDERWAY TO GRAPPLE WITH THIS ISSUE.

THE REAL POINT IS THAT THROUGH THIS MAJOR NATIONAL CONTROVERSY, ALL SIDES WERE WATCHING CLOSELY WHAT THE OUTCOME WOULD BE IN THE TENNESSEE VALLEY--RECOGNIZING THAT THIS COULD AFFECT THE SUCCESS OR FAILURE OF NATIONAL EFFORTS TO SET POLICY IN THIS FIELD.

AND AS YOU KNOW, WE ARE NOT DONE WITH THIS ISSUE YET.

THERE IS ALSO THE QUESTION OF WHERE OUR FUTURE ENERGY SUPPLIES WILL COME FROM--WHAT ARE THE OPTIMUM COMBINATIONS OF CONVENTIONAL SOURCES, NEW TECHNOLOGY, CONSERVATION AND ALTERNATE ENERGY SOURCES. HERE AGAIN, TVA HAS A RESERVOIR OF

SOME OF THE BEST EXPERTS ANYWHERE ON SUCH ENERGY MATTERS, WHO COMBINE A SENSE OF PUBLIC PURPOSE WITH PRACTICAL RESPONSIBILITIES FOR MEETING THE ENERGY NEEDS OF THE VALLEY AND THE NATION.

FINALLY, I BELIEVE CONGRESS WILL CONTINUE TO FACE THE QUESTION OF HOW TO IMPROVE ECONOMIC EQUITY AMONG REGIONS AND COMMUNITIES AND DIFFERENT SEGMENTS OF SOCIETY. THE SPOTLIGHT OF NATIONAL ATTENTION MAY TURN AWAY FROM THAT BASIC ISSUE FROM TIME TO TIME AS OTHER PRIORITIES EMERGE, BUT SOONER OR LATER IT ALWAYS RETURNS. HERE TOO, TVA IS IN A STRONG POSITION TO TRY VARIOUS APPROACHES, AT RELATIVELY SMALL COST, AND TO HELP THE NATION SEE WHAT WORKS.

IT IS NOT MY PURPOSE IN THESE HEARINGS TO DEBATE THE WISDOM OR FEASIBILITY OF TVA. IT HAS BEEN AN AMERICAN INSTITUTION FOR MORE THAN HALF A CENTURY. THE CASE FOR TVA MUST BE MADE ON THE MERIT OF ITS ACHIEVEMENTS.

I THINK IT'S FAIR TO SAY THAT NO OTHER GOVERNMENT AGENCY BEFORE OR SINCE TVA CAN CLAIM SO DRAMATIC A RECORD OF ACHIEVEMENT. FROM THE BEGINNING, TVA WAS MANDATED TO SERVE NOT ONE REGION ALONE BUT THE ENTIRE NATION.

IN THEIR WISDOM, THE FOUNDERS OF TVA ENVISIONED IT AS AN EXPERIMENT TO SERVE AS AN INCENTIVE FOR SIMILAR EFFORTS THROUGHOUT THE COUNTRY. AND IT HAS LIVED UP TO THAT EXPECTATION. IN ITS EARLY YEARS, TVA SHOWED THE NATION AND

THE WORLD THE ENORMOUS POTENTIAL OF WATER-GENERATED ELECTRICITY AND MULTI-PURPOSE DAMS FOR POWER GENERATION, FLOOD CONTROL, AND NAVIGATION.

LATER ON, TVA LED IN ADVANCING THE TECHNOLOGY-OF VERY LARGE AND EFFICIENT COAL-BURNING POWER PLANTS TO MEET GROWING DEMANDS FOR ENERGY.

THE FERTILIZER AND SOIL PROTECTION MEASURE DEVELOPED BY TVA STARTED A REVOLUTION IN AGRICULTURE, WHICH HELPED TO MOVE MILLIONS OF FARMERS, IN THE VALLEY AND OTHER REGIONS OF THE COUNTRY, FROM SUBSISTANCE TO PROFITABLE FARMING.

TVA'S AGGRESSIVE RECLAMATION POLICIES INSPIRED EFFECTIVE STRIP MINE LAWS IN SIX VALLEY STATES AND SERVED AS A NATIONAL MODEL FOR ENVIRONMENTAL RESTORATION. TVA IS ALSO POINTING THE WAY TO A NEW ENERGY FUTURE WITH THE DEVELOPMENT AND TESTING OF CLEANER COAL-BURNING TECHNOLOGY. THIS PROMISES TO PAVE THE WAY FOR GREATER USE OF OUR ABUNDANT COAL RESOURCES, AND COULD CREATE THOUSANDS OF NEW JOBS IN OUR NATION'S DEPRESSED COAL FIELDS.

I AM SURE SPECIFIC TVA POLICIES AND PROGRAMS WILL BE DESCRIBED AND DEBATED BY OTHERS IN THESE HEARINGS. I HAVE TRIED HERE TO FOCUS INSTEAD ON SOME OF THE FUNDAMENTAL ISSUES AMERICA WILL CONTINUE TO FACE, AND ON TVA'S SPECIAL QUALIFICATIONS FOR HELPING US TO FIND WAYS OF DEALING WITH THEM.

AS YOU KNOW, TVA IS ASSOCIATED IN THE PUBLIC MIND WITH THE TELlico PROJECT AND THE SNAIL DARTER CONTROVERSY. IT IS LESS WELL KNOWN THAT TVA BIOLOGISTS HAVE MADE NUMEROUS POSITIVE CONTRIBUTIONS TO THE PRESERVATION OF ENDANGERED SPECIES--BASED ON THE BIOLOGICAL CONCEPT THAT EVERY SPECIES MAKES ITS OWN UNIQUE CONTRIBUTION IN THE CHAIN OF LIFE.

THAT IS ESPECIALLY APPROPRIATE, BECAUSE TVA IS CERTAINLY UNIQUE IN AMERICAN GOVERNMENT, AND THERE IS NO QUESTION IN MY MIND THAT IT OFFERS FURTHER ESSENTIAL CONTRIBUTIONS IN THE FUTURE. AS THE NATION DEALS WITH CURRENT PRIORITIES, I HOPE WE DO NOT LOSE THAT LONG VIEW IN A WAY THAT MAY SACRIFICE THOSE BENEFITS YET TO BE REALIZED.

I BELIEVE THE SECURITY OF AMERICA RESTS WITH OUR COMMITMENT TO TAKE PRUDENT RISKS, TO EXPERIMENT, AND TO EXPLORE NEW WAYS OF DOING THINGS. IT IS ALSO MY BELIEF THAT IN FULFILLING ITS MISSION AS A "LABORATORY FOR THE NATION," AND IN MAINTAINING ITS OWN COMMITMENT TO INNOVATION AND EXPERIMENTATION, TVA CAN PLAY ITS PART IN HELPING TO KEEP AMERICA STRONG.

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Testimony of Senator Albert Gore, Jr.

before the Subcommittee on Regional and Community Development

Environment and Public Works Committee

July 16, 1985

Mr. Chairman, I am pleased to be able to testify today about the many programs the Tennessee Valley Authority carries out with federal appropriated funds. This is an important set of hearings which I believe will show that the TVA has served as a successful, efficient guidepost for programs which have produced extraordinary national benefits.

I believe that any expenditure of federal tax dollars should be subject to careful oversight in the Congress. When I served in the House, I renewed the Tennessee Valley Caucus and held extensive meetings between members of Congress and the TVA Board to examine a variety of problems then facing TVA ratepayers—the financial difficulties in the nuclear power program, various management initiatives, environmental problems, and rates in general.

I can tell you that the TVA Directors were forthcoming, candid, and as eager as we in the Congress were to get to the bottom of whatever issue was at hand. After yesterday's hearings, I believe you will agree with me that the Board and its managers are straightforward advocates of public power, of their ratepayers, and of the innovative federal programs they operate for our country.

I also had the opportunity in the House to serve on the principal committees involved in energy and environmental matters. It was always striking to me that, when we sought an example of outstanding performance in nuclear waste handling, renewal energy and energy conservation, acid rain solutions, new coal burning technologies, water resource management, productive agricultural uses of energy, and a wide range of other energy and environmental technologies, invariably it was TVA which presented the model.

Clearly, the Tennessee Valley Authority has, in its half-century of serving electricity consumers in the Southeast, given this country much more than a hugely successful "experiment" in the public power and economic growth. The TVA has become a major laboratory for this country's efforts to find solutions to many tough energy and environmental problems.

I want to take this opportunity to describe in detail the programs TVA now conducts with federal appropriated funds.

I: INTRODUCTION

TVA's responsibilities under the TVA Act meld its operational obligations for the TVA reservoir and power systems with a mandate to provide leadership in demonstrating appropriate technologies for solving problems in energy services; management of land, water, and other natural resources; fertilizer development and use; and renewable resource-based economic and community development. Thus, TVA is not just a utility or another public agency, but a unique public corporation whose work is intended to benefit not only the Tennessee Valley but the entire Nation.

Most other Federal agencies have a limited view of their responsibilities as their mandates are narrow. They address specific single-purpose issues, i.e., agriculture, housing, environmental protection, or economic development. TVA views all resources as interrelated and approaches the development and use of resources in a unified manner. For example, forest resources can be developed to create industrial jobs while considering the impact on the environment and the services that must be provided in the community where the industry will be located.

TVA is the only agency which has the flexibility to structure its activities as a national demonstration while at the same time focusing them on the special needs of the region. The TVA Act gives the agency a high degree of flexibility in designing its programs to be responsive to the changing needs and opportunities facing the region and the Nation. At present, the overall focus of agency programs is on job creation with emphasis on building public-private developmental partnerships.

TVA has always implemented its programs of agriculture, community, economic, and natural resource development through State and local cooperators.

TVA programs build the capacity and self-sufficiency of those entities that receive the assistance. By working cooperatively through and with State and local governments, the private sector, and other Federal agencies, TVA avoids duplication and ensures that its assistance results in lasting improvements. Over the years TVA has developed the capacity to work simultaneously with several State and local governments to implement projects which cross-governmental lines.

While other national efforts may provide direct assistance to State and local institutions, they seldom operate as partners in implementation, and their programs often create dependence rather than build capacity. In each of its individual activities, TVA seeks to identify the problems, provide a solution, and move on to the next important issue facing the region.

TVA fosters the orderly development of the region's natural resources for the economic welfare of its residents. In order to fulfill this far-reaching mandate, TVA focuses on the economic potential of the region's diversified natural resources. Some TVA economic development-oriented activities are specific to particular natural resources, such as forests, agriculture, and water, and, therefore, require special professional expertise. Other more direct economic development activities help communities understand and capitalize on their locational and resource-based comparative advantages.

Still other direct economic development activities focus on particular sectors of the economy, such as the existing industrial base, commercial business areas, and tourism. All of these areas of emphasis have their own special developmental concerns and needs, but are carefully integrated to ensure that the maximum economic developmental benefit can be generated while maintaining a special sensitivity to the need for environmental quality in the region. Economic development is an integral component of all resource development activities.

In 1984, TVA achieved a minimum 16:1 return on its benefit-cost technical assistance; helped create 2,500 new jobs in existing industries; generated \$5 million in local investment to implement community business development projects; and assisted in the implementation of programs which trained approximately 11,000 persons who eventually were employed in jobs paying an average of over \$8 per hour.

TVA's community assistance activities focus on strengthening the abilities of citizens and their institutions to improve their own communities through technical assistance emphasizing improved use of existing resources, volunteers, and the private sector.

The Tennessee River control system has prevented over \$2 billion in flood damages; the navigation system saves shippers \$160 million annually; over 17 billion kilowatts of hydroelectric power is produced annually; the lakes provide recreation visits for 70 million people a year; and private industry investments have totaled \$4.6 billion in waterfront plants, terminals, and distribution facilities providing nearly 30,000 jobs.

TVA's agricultural development accomplishments include demonstration projects aimed at conserving soil while ensuring clean water and maintaining farm income; developing self-sustaining farmer associations to provide central management services to members; conducting research on finding productive uses for farm waste products; conducting home garden demonstrations to improve the diets and supplement the income of low-income rural families; establishing horticultural farms to demonstrate the need to integrate the production and marketing of vegetables and small fruit; assisting small farmers in developing high-value enterprises so that growers with limited land bases could develop full-time farm operations; and continuing operation of the National Fertilizer Development Center, the Nation's only research and development program for addressing a spectrum of fertilizer concerns. For the past 50 years, the fertilizer center has played a leading role in developing and introducing into the marketplace most of the fertilizers that are responsible for America's agriculture industry being the best in the world.

In the area of forestry development, TVA works with Federal and State agencies and the private sector to implement a balanced strategy to create domestic and international markets for the Nation's forest products; stimulate demand and provide incentives for industry and private landowners to protect and manage their forests for long-term supply; and get practical high technology tools and current information into the hands of practicing foresters, timber harvesters, and plant managers.

The Land Between The Lakes (LBL) is the second largest contiguous unit of Federal property east of the Mississippi River. The 2 million annual visits to LBL support over 2,000 jobs and are the focal points for a \$150 million tourist industry.

No State and local government agency has had sufficient experience to guide or duplicate most of TVA's economic, community, and natural resource development ventures. TVA has invested substantial resources over the past 53 years to accumulate the expertise and experience necessary to provide the leadership in helping to develop and implement these programs. Communities in the region are grateful for TVA's initiative in these areas. I believe TVA's efforts are important, even critical, to the future development of the Tennessee Valley region and to serve as a national demonstration model for economic, community, and natural resource development programs.

The following is a synopsis of many, but certainly not all, programs of TVA devoted to the integrated mission of improving the economy and the natural resources of the Tennessee Valley area, and at the same time serving as a trend for better national programs.

II: BUILDING STRONG SELF-RELIANT COMMUNITIES

TVA's regional development programs stress cooperation with local and State agencies in order to avoid duplication and also to create an increased sense of ownership and pride at the local level. The themes of partnership and assistance are evident in TVA's initiatives to help local communities help themselves.

Community Preparedness

Helping communities make better use of their human, fiscal, and natural resources to create jobs and improve their quality of life is the goal of TVA's Community Preparedness Program. Starting with broad-based needs assessments, which enable communities to identify their own problems and opportunities, TVA helps communities create development strategies that recognize the importance of balanced economic growth and proper use of resources.

This is the approach being used by Ashland City, Tennessee. Focusing on the community's solid waste problem, Ashland City began efforts to clean up roadside dumps and develop a solid waste collection system in conjunction with the State of Tennessee and TVA. This initial focus on solid waste management led to a wide-ranging community effort that includes creation of a local community preparedness task force, a courthouse improvement project, creation of a local community preparedness task force, a courthouse improvement project, creation of a downtown merchants association, plans for downtown revitalization, and organization of a youth involvement program. A comprehensive development strategy is being prepared to identify activities to further build community pride and create jobs.

In 1984, public and private organizations spent more than \$18 million to carry out TVA-assisted community preparedness projects.

Budget: FY 84, \$1.4 million; FY 85 estimate, \$1.25 million.

Special Opportunities Counties and Cities

The Special Opportunities Counties and Cities (SOCC) program is an innovative demonstration program developed by TVA that has potential for Nation-wide application. It is designed to concentrate on solving the problems of the poorer, less developed areas of the Valley, those with chronic problems that have caused them to lag far behind both the region and the Nation in economic development.

At least 50 of the 201 Valley counties can be considered economically disadvantaged. All 50 are characterized by several symptoms of poverty. Last year, SOCC joined with 25 of these distressed areas to help provide tools for economic improvement. Projects were selected on a competitive basis, and each met the major criteria needed to qualify for assistance: a strong local commitment, a private/public partnership, a sound business plan, and permanent jobs for local residents.

With encouragement and direct assistance from SOCC staff members, communities tackled their problems head-on. The result: more than 1,500 new jobs and almost \$5 million of additional public and private investment. Manufacturing and other industrial development accounted for most of the improvement in the participating counties, but jobs were also created in the agricultural and natural resource sectors.

Budget: FY 84, \$2.2 million; FY 85, estimate \$5.7 million.

Townlift

The Townlift program helps communities increase their tax bases, improve local markets, attract new industries, and create new jobs. An important goal is to increase local resources for projects such as business recruitment, expansion of commercial and retailing enterprises, housing construction, and the restoration of central business districts.

In 1984, Townlift planning and development assistance was provided to 68 communities. More than \$25 million in private and public funds was spent to carry out the townlift recommendation.

For every dollar TVA spent in 1984 providing technical assistance to Townlift projects, more than \$30 was attracted from the private sector and other public agencies.

Budget: FY 84, \$.78 million; FY 85, estimate \$.86 million

Tourism and Focused Activities

The steady rise in the travel industry and related employment in the region has continued in the face of general economic recession in recent years. In 1984, tourism contributed \$5.8 billion to the Valley's economy and accounted for some 320,000 jobs.

The goal of TVA's tourism program is to help sustain the growth of capital investment and employment. TVA has provided technical and financial assistance to more than 70 counties and regional tourism groups. This assistance helps create jobs, provide income, and generate tax revenue for local economies.

In addition to this type of general planning and assistance, TVA works with communities in helping them face specific everyday problems such as getting the most from their water systems, developing efficient transportation arrangements that save fuel, and handling community waste.

For example, TVA has helped 214 local water systems find leaks in their public water supplies, resulting in monthly savings of around 215 million gallons of treated water, valued at \$170,000.

More than 20 county governments have adopted the convenience center concept of rural solid waste collection with TVA assistance. Three recycling demonstrations at Athens, Alabama, and Grainger County and Waynesboro, Tennessee, last year salvaged nearly \$120,000 worth of materials weighing more than 1,400 tons.

Public officials and private employers are increasingly regarding efficient commuter transportation systems as effective tools of economic and community development. Recognizing that increased mobility of citizens expands job opportunities, TVA's Transportation/Ridesharing Technical Assistance Program's primary objective is to accelerate the growth of self-sufficient transportation and ridesharing operations. Van pools also conserve petroleum, improve air quality through reduced traffic congestion, and save money for workers who commute.

During 1984, TVA provided technical assistance to more than 25 private and public organizations and communities, assisted in the establishment of a public rural transportation system in northwest Alabama, and helped start six van pools. Together these efforts reduced gasoline consumption by 500,000 gallons and saved participants about \$625,000 in commuter costs.

Whether aiding in general planning and development, or helping a community work through a specific problem, the objective of TVA's community and economic development programs is to build self-reliance rather than long-term dependence on public funding. Thus, technical assistance, not grants, is TVA's principal form of aid; typically accompanied by commitments from local, state and private contributors which often far exceed TVA's expenditures.

III: STRENGTHENING PRIVATE - PUBLIC SECTOR PARTNERSHIPS

In addition to strengthening local communities in ways that make them more self-reliant and less dependent, TVA is lending technical assistance to the region's business community. But the same principle applies—TVA helps with a hand, not a handout. Technical assistance is available for a variety of situations, but with the integrating aim of stimulating balanced economic growth through cooperative programs with the private sector and other public agencies. In these activities, TVA uses the region's natural and human resources for the building blocks of growth.

Economic Analysis

TVA evaluates the impact of proposed policies and economic trends in the region, while at the same time providing a variety of technical and data services to support economic and industrial development programs. In 1984, TVA conducted 50 economic analyses to support local economic development projects in communities throughout the region.

TVA has also developed a Regional Economic Simulation Model to track swings in the economy and enable TVA to better forecast long-term trends. The model is used in regional development studies and in power system load forecast analyses. It also provides a set of economic indicators that can be used to test the regional economy's sensitivity to various demographic and economic changes.

Enterprise Development

As has been the case in the recent past, most new jobs in the Tennessee Valley will be offered by small businesses in the 1980s. The special needs of this sector are met through TVA's Enterprise Development Program which in 1984 assisted more than 600 small businesses.

Technical support for innovation is also provided through review of new technology and through grass-roots inventors' organizations. These efforts help create jobs while facilitating technological change.

Existing Industries Program

Last year, TVA conducted an Existing Industries Program demonstration in cooperation with eight distributors of TVA electricity. This program stimulates the creation of new jobs by helping plant managers lower operating costs and by freeing resources for expansion. Services offered by TVA include energy management surveys, transportation rate analyses, preliminary civil engineering assessments, information on water supply and waste disposal, air pollution control, and employee training.

TVA worked with 87 manufacturing firms in the eight target areas, providing 200 services which led to the creation of 2,489 new jobs. Based on the success of this demonstration, the program will be expanded Valley-wide in 1985.

Economic Development/New Industries

TVA also helps encourage industrial development by offering economic research data, industrial site planning, and other technical assistance to State and regional industrial development organizations.

One of the TVA's major activities in this field is to identify appropriate waterfront sites for development purposes. These sites are categorized on the basis of in-depth engineering and environmental analyses. Such information is crucial to companies comparing prospective industrial sites, and it also helps communities attract quality industries.

TVA provides engineering assistance to support its economic and community development programs. This involves identifying and evaluating potential industrial sites and preparing preliminary development plans and cost estimates. The focus is on smaller communities that lack their own technical resources.

In 1984, Engineering Services specialists provided 24 engineering studies to communities. As a result, these communities are now in a stronger position to attract new industries and create new jobs.

Budget: The four activities just mentioned in the areas of economic analysis and development are part of a \$3.5 million budget for FY 84, with expected expenditures for FY 86 of \$3.6 million. This budget category also includes TVA technical assistance for tourism development and focused activities mentioned earlier.

Skills Development

During its first 50 years, TVA provided thousands of jobs and served as a catalyst for hundreds of thousands more. Today it views skills redevelopment and high-technology training as vitally important to the creation of industrial jobs for the future.

These efforts are conducted largely in cooperation with State and local agencies. In 1984, with TVA assistance, more than 11,000 people were trained and placed in private sector jobs paying an average wage of \$8 per hour. This is expected to add about \$121 million in annual wages to the region's economy. A high-technology skills program provided training to about 4,500 residents; an industry-specific program provided training to 6,400 more. Educational and training assistance was also provided to more than 200 local development agencies, educational institutions, and industries.

Budget: FY 84, \$4.7 million; FY 85, estimate \$3.8 million.

Navigation Development

The Tennessee River waterway, which stretches 650 miles from Knoxville, Tennessee, to Paducah, Kentucky, has been a major economic stimulus for riverfront communities. Since 1945, when TVA's basic system of mainstream dams, locks, and reservoirs was completed, private industry has invested more than \$4.5 billion in waterfront facilities.

Last year, several firms began building or announced plans for new or expanded facilities. These firms expect to invest more than \$50 million in plants and equipment and will eventually employ between 600 and 800 people.

In 1984, TVA helped seven port authorities and prepared preliminary site plans for a new waterfront manufacturing firm. Construction was completed at three terminals, and improvements are under way at one other. Navigation data and transportation studies were provided to about 50 companies, government agencies, and local development groups.

Budget: FY 84, \$9 million; FY 85, estimate \$1.1.

Recreation

In response to a significant demand for stream recreation, TVA acquires small tracts of land to provide public access to Valley streams. To date, the agency has acquired or developed 80 sites. The majority of these (54) have been maintained through cooperative agreements with local and State governments.

This past year, using Federal jobs bill funds, cooperative agreements were signed for the development and maintenance of nine river access sites; nine sites were refurbished, including two on the Ocoee River; and two new river access sites were developed.

Federal jobs bill funding was also used to finance three new trails on TVA land. Two of these, one on Watts Bar Reservoir and the other on Guntersville Dam Reservation, will be maintained by private organizations under license agreements.

The TVA system of lakes comprises an outdoor recreation resource of regional and national significance. To maximize their potential use, ten TVA reservoir recreation areas were upgraded last year, and one additional site was made available to a private operator. Cooperative operation and maintenance of other selected TVA areas by public agencies or the private sector continued. Budget: FY 84, \$8.3 million; FY 85, estimate \$9 million.

Recreational and industrial development along the region's waterways are a major source for economic advancement and TVA's specialized knowledge and engineering expertise can help local and State governments take advantage of these opportunities.

IV: DEVELOPING NATURAL RESOURCES: WATER

One of the traditional ways that TVA helps promote community and economic development is through developing and encouraging the wise use of the region's natural resources, particularly the region's waterways and lands.

For example, the economic development and benefits of TVA's reservoir operations are clear. Economic benefits of the reservoir system are measured in part by:

- o Flood damage prevention that averages \$140 million each year.
- o A navigation channel that extends over 650 miles of the Tennessee River and 150 miles of tributary streams, saving shippers \$160 million each year.
- o Hydroelectric power production of 20 billion kilowatthours during fiscal year 1984, the equivalent of almost 9 million tons of coal or 50 million barrels of oil.

Reservoir Operations

A specific example of flood control benefits was provided last year. Had there been no reservoir system to regulate the streamflow, a series of three storms in late spring would have created the sixth largest "natural" flood of record at Chattanooga. The actual water level in Chattanooga crested about five feet above flood stage with estimated damage of about \$3 million, but without flood storage in the upstream reservoirs the water would have been 16.5 feet higher and caused an estimated \$700 million in damages. And there is no easy way to measure the suffering such a major flood would have caused.

But flood control is only one of the functions of TVA's reservoir system. The reservoir system is operated on a daily basis for the primary purposes of flood control, navigation, and power generation. However, other programs, such as water supply, water quality, recreation, fish spawning, weed control, and vector control are benefited by such operations. During the past year some 200 special operations were conducted at various dams and reservoirs to provide requested water levels or streamflows for a wide variety of needs such as repair and maintenance of structures, construction at TVA projects, construction of bridges and pipelines by private contractors, control of aquatic weeds, environmental surveys, and recreational events.

Budget: FY 84, \$2.0 million; FY 85 estimate, \$2.1 million.

River System Improvements and Water Resource Management

In a long line of improvements along the Tennessee River, two were accomplished during the past year year 1984 that demonstrate the multipurpose dimension of this waterway system. One improvement holds potent for improving the regional economy through increased navigation and the other promises to make the region more enjoyable, both for its residents and for visitors.

In terms of navigation, the new main lock at Pickwick Landing Dam opened to river traffic during the summer of 1984 at a cost of about \$120 million—more than 16 percent below the 1980 cost estimate. Man-hours expended to the end of the fiscal year totaled 3.25 million, 35 percent below the 5 million man-hours originally estimated for the job. This new lock will enable increased barge traffic, not only along the the Tennessee River, but along the adjoining Tennessee-Tombigbee waterway.

In terms of recreation, a long controversy ended when Congress passed a special \$7.4 million appropriation to support recreation on the Ocoee River below the Ocoee No. 2 Dam. Of this total, \$6.4 million is to provide required compensation to the TVA power system for its increased costs, and \$1 million goes to the expenses of maintaining the recreation area. This appropriation, along with other value to be received from the State of Tennessee under an agreement for recreational releases at Ocoee No. 2 and for the operation and management of the whitewater recreation area, will enable TVA to provide 116 recreational release days annually. The legislation also requires that the entire \$7.4 million be repaid to the Treasury from the imposition of fees for such recreational activity. These arrangements will benefit not only whitewater enthusiasts, but also recreation and tourism in east Tennessee.

Also, every year TVA undertakes a number of routine projects that keep dams safe and reservoirs in good shape.

For a number of years, TVA has been placing heavy emphasis on water quality management plans for its reservoirs. During the past year, a management plan was published for Cherokee Reservoir. A draft plan was completed for Fort Loudoun and Tellico reservoirs, and water quality reports on Pickwick and Ocoee No. 1 reservoirs were completed.

The extent of bacterial contamination in Boone Reservoir was determined, and water quality was assessed as the first phase of development of a management plan for the reservoir. Nonpoint sources of bacterial contamination of the Bear Creek floatway were identified to set priorities for corrective action. An assessment was begun of water quality in north Alabama, and cooperative efforts to improve water quality in the North Fork Holston River, Huntsville Spring Branch, and Chattanooga Creek were continued.

Research continues on methods for increasing dissolved oxygen in the water released from hydroelectric turbines. These efforts are intended to find out how aquatic life downstream from dams can be improved by aerating hydroturbine releases. A new aeration system has been installed at Tims Ford Dam, where dissolved oxygen concentrations were increased from about 2 mg/l to 4-5 mg/l. The Clinch River weir was completed in 1984 two miles downstream from Norris Dam to provide a higher minimum flow in the river when the Norris hydroelectric turbines are not releasing water.

Budget: FY 84, \$2.8 million; FY 85, estimate \$4.9 million

Fish and Aquatic Studies

TVA aquatic biologists and engineers in the Division of Air and Water Resources have been instrumental in the past year in the resetting of thermal discharge limits for the condenser cooling water at Browns Ferry Nuclear Plant. The original temperature requirements were overly restrictive, because the effects of releasing large amounts of warm water into Wheeler Lake were not well-known. It is estimated the new limits will save electricity consumers from \$4 million to \$14 million dollars each year by reducing the use of cooling towers.

TVA and the Tennessee Wildlife Resources Agency are involved in a cooperative project to stock "saugeye"—a cross between sauger and walleye—in Cherokee Reservoir. TVA has provided funds to rehabilitate the Tennessee Wildlife Resource Agency Morristown Hatchery for production of saugeye and for a creel survey to determine angler harvest. Although still in the evaluation stage, results have been excellent with high growth (three pounds at two years age), survival, and harvest of stocked fish.

As part of research efforts on protecting endangered species, major progress was made on the rearing of freshwater mussels in the laboratory. For the first time, a procedure has been developed and demonstrated successfully for rearing juvenile mussels in the lab. The next major effort planned is to demonstrate field transplantation of laboratory-reared juvenile mussels.

Budget: FY 84, \$.9 million; FY 85, estimate \$.6 million

Reservoir Ecology

Satisfactory control of aquatic weeds and mosquitoes and other insect pests is necessary to the development and use of the TVA reservoir system. The recent proliferation of hydrilla, a non-native aquatic weed, in the river system, and increasing mosquito resistance to some commonly used insecticides requires continued exploration of control methods by TVA.

Heavy rains and flooding in the Tennessee Valley during the 1984 spring breeding season required heavier than usual application of insecticides for mosquito control. Production of mosquitoes — both floodwater and transient pool types — was up sharply. Numerous requests were received from Valley communities for mosquito control assistance. Technical advice has been provided to as many as possible, and actual control operations have been conducted for some on a cost-reimbursable basis.

The effects of the 1983 experimental summer drawdown of Guntersville Reservoir, which helped control aquatic weeds and mosquitoes during that year, extended to 1984 so that a fall drawdown was not necessary. A drawdown of Chickamauga Reservoir for weed control was begun this summer.

Field testing of various formulations of pesticides and application techniques continues. Special studies begun in 1983 involving the use of a bacterial agent for mosquito control and has shown considerable promise.

A weed-eating fish, the white amur, has been introduced into a controlled embayment of Guntersville Reservoir to test its potential for reducing aquatic weeds. The fish also has been introduced into a small embayment on Melton Hill Reservoir and small impoundments at Land Between The Lakes for other studies.

In addition to controlling aquatic weeds in TVA waters, TVA provides technical assistance to communities. More than 800 individual complaints were investigated and assistance provided where appropriate, in 1984.

Budget: FY 84, \$2.5 million; FY 85 estimate, \$1.9 million.

Reservoir Lands Planning

More and more, the public is having a voice in decisions affecting the management of natural resources. TVA's reservoir land planning program is a prime example. Begun in 1981, this long-range process takes the extensive mass of existing data about a reservoir and TVA's adjoining land—including economic and cultural information—and examines it in the light of local needs and priorities. The most suitable uses for particular pieces of shoreland are identified.

The Watts Bar Reservoir, 95 miles long, has been the focus of TVA land planning efforts this year. Public meetings are being held and by year's end a draft plan will be ready for public review. Last year, a land planning program was begun for Kentucky Reservoir.

The plan recognizes the important differences among the northern, middle, and southern portions of the Kentucky reservoir. For example, it recognizes the economic importance of recreation and tourism in the upper portion, industrial development in the middle section around New Johnsonville, Tennessee, and the extensive natural resource base in the southern end. Land uses have been identified accordingly.

There are 40,410 acres of TVA land along Kentucky Lake, not counting the Land Between The Lakes, which is managed as a separate entity. These acres are earmarked in the plan for one or more of 20 possible uses ranging from industrial or recreational development to forestry and development as a wildlife habitat. Most tracts are allocated to multiple uses. The coordinated management of the various land tracts will be a highly visible example of a key TVA principle at work—the principle of integrated resources development and management.

The data base developed for each reservoir land plan is computerized. In previous years, plans were completed for Pickwick (1982) and Guntersville reservoirs (1983).

Budget: FY 84, \$.7 million; FY 85 estimate, \$.7 million.

V: DEVELOPING NATURAL RESOURCES: LAND

The long-range goals of fertilizer research and development are to develop for the Nation more efficient, lower-cost fertilizers and environmentally safe manufacturing processes which consume less energy and nonrenewable resources, and to promote fertilizer use practices which maximize agricultural production and maintain environmental quality.

To accomplish this program, the following objectives are emphasized:

- o Increase the efficiency in U.S. fertilizer use through improvements in products, application, and use systems, with particular emphasis on nitrogen.
- o Decrease the energy required to produce, transport, and apply fertilizers.
- o Find more efficient means for processing U.S. phosphate rock with increasing emphasis on the use of the lower-quality materials of the future, and evaluate the effects of these lower-quality materials on the agronomic performance of phosphate fertilizers.
- o Decrease the use of natural gas and oil in fertilizer production.
- o Avoid environmental damage from production and use of fertilizers.
- o Continue to contribute to the basic knowledge of the marketability and the agronomic, chemical, and physical properties of fertilizer raw materials, intermediates, and products.
- o Develop fertilizer materials and application techniques which are compatible with and beneficial to major new agricultural systems, such as the increasingly popular reduced-tillage practices.
- o Develop and demonstrate technologies for using agricultural, municipal, and industrial wastes beneficially in a wide variety of agricultural enterprises as fertilizers, feeds, or energy sources.

TVA's strategy in accomplishing these goals and objectives is to develop new technologies for meeting present and future needs and to help channel the new developments into a competitive fertilizer and agricultural industry. An "open-door" policy for visitors, nonexclusive licensing of TVA processes and products, and publication of research findings help speed new developments to users. This policy, coupled with TVA's long-standing close relationship with the manufacturing and farming industries and land-grant universities, has resulted in an information feedback network which is unique to TVA.

New Fertilizers

TVA has the only comprehensive program in the country for developing, testing, and introducing a range of new fertilizer technology. The effort includes work in laboratories, greenhouses, pilot and prototype plants, and extensive interaction with farmers and members of the fertilizer industry in nearly every state.

A major long-term research goal is to improve the efficiency of crop use of nitrogen, the most expensive fertilizer to produce and the one most used in large amounts. This work involves trying new nitrogen sources, searching for chemicals to control fertilizer reactions in the soil, developing more efficient manufacturing processes, and testing different ways of applying the fertilizer.

In an ongoing effort to reduce losses of ammonia (an especially serious problem with surface-applied urea), tests have been conducted with a new fluid fertilizer made from urea, ammonium nitrate, and phosphoric acid. Liquid and granular urea-nitric phosphates, which hold promise for improving nitrogen efficiency, have been also tested.

Other research indicates that one chemical being tested —thiophosphoryl triamide— is at least as effective as the best material known for slowing chemical changes in urea nitrogen after application to the soil.

Another priority at the National Fertilizer Development Center (NFDC) is to develop better ways of converting phosphate rock into fertilizers. New technology is needed to recover more of the ore, particularly from rock containing large amounts of impurities.

Small-scale tests begun in 1984 gave signs of a breakthrough in this area. The experiments center on a new process in which ore is pretreated with a chemical. This is followed by one-step flotation to separate the phosphate from various impurities. Early results are very promising in terms of prospective operating economics and nutrient recovery.

Also, for the first time in 1984, urea granules one-fourth inch in diameter were produced in TVA's demonstration curtain-granulation plant.

TVA's ammonia-from-coal facility continues to be used for test purposes, including use of Utah coal in a test for the Electric Power Research Institute. Several facility modifications have improved operating reliability significantly.

Fertilizer Distribution

In 1984, TVA sold 147,209 tons of experimental fertilizers to 106 firms in 29 states and Puerto Rico.

Production of these fertilizers in TVA's prototype plants helps identify and resolve problems not apparent in smaller-scale tests, and provides a more realistic demonstration of manufacturing methods. Offering the products to interested fertilizer firms makes private evaluations easier and helps "seed" the market before major commercial investments are made in new technology.

In tonnage, TVA produced more granular urea than any other fertilizer last year. More than 48,000 tons of this high-nitrogen fertilizer was used by 30 firms in 17 states, led by Missouri, Tennessee, Illinois, Iowa, and Alabama.

More than 15,000 tons of urea-ammonium phosphate (35-17-0 and 28-28-0) were distributed across the country in 1984. Popularity of the 35-17-0 grade among California rice growers prompted a private producer to begin manufacturing a similar fertilizer there.

Substantial tonnages of several fluid suspension fertilizers were distributed. Shipments of 13-38-0 totaled 13,822 tons going to 26 firms in 10 States. Total for the 9-32-0 suspension introduced in 1983 was 10,286 tons, shared by 29 firms in 12 States.

About 2,000 tons of 11-35-0 and 300 tons of 12-36-0 were shipped to three States. Distribution of urea ammonium nitrate suspension to 35 companies in 17 States exceeded 29,000 tons.

TVA engineers work closely with private firms to help them fit or adapt new technology to their operations. One major producer of ammonium phosphates, for example, showed significant potential for a modified version of TVA's pipe reactor technology. With further plant modifications, the production rate should be at least one-fourth higher. This work also represents a step toward use of "sludgy" phosphoric acid to make granular ammonium polyphosphate fertilizer.

Fertilizer Information

TVA shares its new fertilizer information widely. For example, six new fertilizer patents were obtained last year, and two licenses were granted. This brought to 663 the number of licenses issued for nonexclusive use of TVA developments. They have gone to 390 companies for use in at least 579 plants in 39 states.

Information is shared with visitors to the Fertilizer Center, through fertilizer conferences, and in technical and scientific publications. Last year, 1,406 technical visitors came to Muscle Shoals for help on problems.

TVA staff also conducted or assisted fertilizer conferences and workshops in areas outside the Tennessee Valley, including national conferences in Des Moines and in Kansas.

Fertilizer Technology Introductions

TVA works closely with universities and the national fertilizer industry to introduce new fertilizer technology. Activities were conducted in 44 states and Puerto Rico in 1984. They included about 1,200 agronomic, enterprise, and whole-farm demonstrations.

Other TVA-supported research projects include fertilizer application in no-till farming, introducing sound fertilizer use concepts in Alaska, identifying zinc deficient areas in New York, and testing new TVA fertilizers in different farming areas.

Fifty-nine whole-farm demonstrations were conducted in Missouri, Illinois, Pennsylvania, and Ohio last year. These farm demonstrations, some of which are cosponsored by local agribusiness firms, provide guidance for other educational programs.

These are just examples of numerous programs carried out under the National Fertilizer Development Program. The total 1984 budget for this program was \$72.6 million. The estimated 1985 budget is \$75 million.

Family Farm Protection and Soil Erosion

TVA continues its efforts to reduce the alarming rate of erosion that resulted when farming practices changed several years ago. Millions of tons of topsoil have been lost and major water quality problems have resulted in some areas.

Last year, TVA joined with the U.S. Department of Agriculture and each of the Valley states in an intensive conservation effort called "Land and Water 201." The program is reaching out to the 201 counties of the Tennessee Valley region. TVA furnishes offices for U.S. Soil Conservation Service personnel and TVA staff who are leading the program.

The challenge was well-identified in west Tennessee where 2.8 million acres of sloping cropland was losing 35 to 40 tons of soil per acre per year five years ago.

Average losses have been reduced by four tons per acre, reflecting results of a variety of TVA program activities. Far greater reductions — ranging from 18.4 to 6.3 tons per acre — have been achieved on individual Resource Management Conservation farms.

Conservation tillage is just one of the tools TVA has promoted in the cooperative erosion control effort. Nearly one in five acres of cultivated crops now is planted by no-till methods, rather than annual plowing.

Farms in the Tennessee Valley are small compared to those in other sections of the country, averaging fewer than 150 acres. Systems designed for large farms with huge machinery often do not fit Valley conditions. Therefore, TVA works closely with land-grant universities and others to identify and promote practices that farmers with limited resources can use to improve their income and quality of life.

Last year's resource development activities included assisting 20 "Rapid Adjustment Farms," which test innovative changes; 534 Resource Management Farms, which demonstrate how proven practices can be applied for profit; and more than 200 "Resource Management Conservation Farms," which concentrate on soil and water conservation.

Beyond this, last year, TVA joined with others in sponsoring 18,500 home-garden demonstrations across the region. Dollar input is low, but rewards are high. In the Purchase Area of Kentucky, for example, TVA's average assistance of about \$40 per garden helped produce an average of more than \$600 worth of food.

Farm demonstrations do double duty by verifying university research findings under different farming conditions while exposing large numbers of farmers to practical solutions to their problems. Results of the demonstrations, supervised by university staffs, often become the basis for state-wide educational efforts. Participants typically make substantial progress during five years in the cooperative program. Even in "hard times," most increase their profits.

Forestry

Forests cover nearly 60 percent of the Tennessee Valley and offer tremendous potential for development as a regional and national "wood basket" to meet society's future demands for timber, fiber, fuel, recreation, and related uses.

Although annual growth of the Valley's predominantly hardwood forest has doubled since the 1930s, it still needs to increase by 40 percent to achieve its full potential. The Nation's wood demand for the early 21st century is projected to exceed annual growth, and the forest products industry will be counting on increased production per acre. Shortages in the pine inventory are expected as early as 1990, so it is expected there will be increasing pressure to harvest hardwoods.

TVA is emphasizing the stimulation of demand for hardwoods, however, so that better management practices to ensure future supply can be worked in with profitable use of the resource now. There is a present need to make better use of the current oversupply of hardwoods—especially low-quality stock. This strategy, it is believed, will provide some incentive for landowners to better manage their forests, and thus help meet the needs of the 21st century.

In 1984 TVA efforts, along with those of cooperating organizations, resulted in the announcement of plans for two structural board plants in southwest Virginia and 16 other plant sitings or expansions in the region, representing \$32 million in investment, 920 new jobs, and annual use of 12 million cubic feet of hardwoods.

The TVA role includes assistance to more than 100 forest product firms in the form of economic analyses, plant location studies, sawmill energy reduction strategies, timber product improvement analyses, a continued Valley-wide cost-reduction program for lumber-drying, and major cooperative efforts with Hiwassee Land Company and the Alabama Forestry Commission.

Budget: FY 84, \$1.8 million; FY 85 estimate, \$2.3 million.

Biomass

For the past five years, TVA has had a major research program to develop new technology for producing liquid fuels from trees and agricultural crops. As mentioned above, the Valley has huge tonnages of unused, low-grade hardwoods with potential for conversion to ethanol. Substantial acreages of marginal cropland also might be used to grow fuel crops.

Wood-to-ethanol research in the laboratory has indicated that fuel yields can be increased significantly. Scientists now are ready to scale up the test work to a two-tons-per-day pilot plant. Other researchers are assembling information on wood supply, wood harvesting techniques, and transportation equipment.

A 10-gallons-per-hour pilot plant for producing ethanol from agricultural crops or residues was completed in 1984. It extends and refines earlier research at Purdue University.

Several biomass fuels projects are conducted for and funded by the U.S. Department of Energy (DOE). TVA is providing technical monitoring of commercial ethanol plants with DOE-guaranteed loans. It also is managing the 13-state Southeastern Regional Energy Program through which DOE funds biomass projects by university and industry researchers.

TVA also provides support in biomass to the Agency for International Development and serves on several regional and national committees on renewable energy.

Budget: FY 84, \$4.9 million; FY 85 estimate, \$4.0 million.

Land Reclamation

The minerals in the land of the Tennessee Valley have provided a basis for gainful employment and industrial development for many years, but the mining of these resources has left a legacy of abuse that not only scarred the land but in many instances polluted the water. Progress is being made in reclaiming a number of abandoned mining sites which have adversely affected regional water quality.

In the Nolichucky River watershed in eastern Tennessee, 332 acres were treated in 1984, which means that most of the basin's 580 acres of environmentally destructive mineral mines (mica, feldspar, and clay) have now been successfully reclaimed. Runoff from these sites has caused serious sedimentation problems downstream for many years.

As part of the cooperative natural resource development plan for the Upper Duck River basin in middle Tennessee, TVA has treated some 150 acres of phosphate mines that caused offsite sedimentation.

A similar demonstration was launched last year on 80 denuded acres in the Copper Basin area of Polk County, Tennessee, and Fannin County, Georgia. Tennessee Chemical Company, the U.S. Soil Conservation Service, and others participated in this effort.

Under contract with the U.S. Army Corps of Engineers, TVA has begun reclamation efforts on 60 hazardous underground coal mine entries and 25 acres of highly acidic refuse in the Big South Fork National River and Recreation Area in Kentucky and Tennessee.

With the aid of the national Jobs Bill program, 315 more acres of abandoned coal mines were reclaimed in the Upper Bear Creek Reservoir of northwest Alabama. This brings the total acreage reclaimed there to 535. Alabama and the Office of Surface Mining (OSM) began reclamation on another 102 acres.

Jobs Bill reclamation activities were completed on 120 acres in Campbell County, Tennessee.

VI: PRESERVING THE REGION'S NATURAL HERITAGE

Land Between The Lakes

The interconnections of natural resources—and the evidence of their wise management—are dramatically apparent at Land Between The Lakes.

LBL is a 170,000-acre national recreation area in western Tennessee and Kentucky that helps support a \$150 million tourism industry in that area. More than two million people came to LBL in 1984, including visitors from all 50 States and 19 foreign countries.

But it is more than a recreation spot. One of its main purposes is to demonstrate sound practices for managing natural resources in a way that supports many different uses.

Eagle restoration efforts at LBL took a new turn recently — Eagle Trust, International, announced it will move its headquarters to LBL, where it will continue the captive breeding of native eagles and other raptors. Eaglets hatched by Eagle Trust will be "hacked"—reared in isolated captivity and released—at LBL, as well as at other locations. "Hacked" birds usually return to breed and nest in the area where they were released.

Empire Farm, an educational demonstration in energy conservation and self-sufficiency, offers visitors hands-on experience in creating an environmentally conscious lifestyle. Workshop and program topics vary from constructing solar hot water heaters to increasing residential energy efficiency. Empire Farm itself is equipped with both passive and active solar hot water heaters, photovoltaic cells, and a sunspace addition. The most recent installation is a sunscreen.

Timber harvest operations in 1984 at LBL created more than 100 full-time jobs in the local area, contributing in excess of one million dollars in wages. Harvests are carried out so as to improve conditions for wildlife. LBL's forestry program serves as a national demonstration in multiple-use management, providing research and demonstration opportunities as well as a setting for environmental education and recreation.

Work started in 1984 on developing a farmland management demonstration area, a cooperative venture with TVA's Office of Agricultural and Chemical Development, the U.S. Soil Conservation Service, Stewart County, Tennessee, and several State organizations. The project will demonstrate a variety of conservation practices, including the use of grassed waterways and contour plowing, as well as the use of farmland for wildlife habitat and the planting of wildlife food crops.

There has been a stepped-up effort to develop cooperative programs and to transfer lessons learned at LBL to other organizations. Examples: in 1984, 74 students from 40 universities were trained at LBL; the World Wildlife Fund sponsored an internship for a professor from Columbia University; tick-control research efforts cosponsored by TVA and the U.S. Department of Agriculture were expanded; a national workshop was conducted for park administrators and law enforcement personnel from 14 States and five Federal agencies; and a cooperative project with the University of Kentucky Bureau for Exceptional Children was expanded to provide training for teachers and parents in 13 States.

The Land Between The Lakes Association, established in 1984, has recruited more than 1,000 charter members. This is a private, nonprofit organization whose activities so far have included securing an \$18,000 grant to study the history of the iron industry in LBL. The Association is seeking private sector financial support for the Eagle Trust move to LBL and is developing volunteer programs to expand LBL's programs' capability.

Budget: FY 84, \$6.7 million; FY 85 estimate, \$7.2 million.

Wildlife

TVA's mandate to develop and conserve the natural resources of the region is providing richer lives for wildlife residents as well as humans. Extensive land, air, and water quality improvements, made in cooperation with State and other Federal agencies, have helped provide diverse, healthy homes for many species.

Some have responded favorably to recent improvements in environmental quality. Populations of great blue herons, the largest wader in Tennessee Valley waters, have increased from 135 nests in three colonies to 1,441 nests in 11 colonies during recent years. Other once-common wading birds will also be helped. An effort is underway to release great egret and restore this magnificent white wader to the Tennessee Valley.

TVA's cooperative efforts to restore resident populations of raptors (birds of prey) have met with resounding successes. From a modest beginning in 1978, the program has released to the wild, as fledglings, 131 ospreys, 31 golden eagles, 22 bald eagles, 8 peregrine falcons, and 4 barn owls. Also in 1984, the first successful common raven nest ever documented in Kentucky was discovered. It was found by a TVA/Kentucky Department of Fish and Wildlife Resources team which was evaluating the potential for a cooperative raven restoration project on the Cumberland escarpment of eastern Kentucky.

Budget: FY 84, \$.9 million; FY 85 estimate, \$1 million.

Environmental/Energy Education

On the premise that citizens informed about their relationships to the environment make wise choices about use of resources, TVA's Environmental/Energy Education Program has, during the past year, concentrated on three citizen groups: students, homemakers, and visitors to TVA lands and facilities.

To reach students, TVA maintains a partnership of Valley universities by means of university-based centers for environmental and energy education. Eight centers functioned in 1984 to provide teacher training, curricula for schools, specialized programs for citizen groups, and research for educators. An estimated 960,000 student-days of environmental and energy education was achieved through this network.

Other products from the university network included energy education materials, computer training workshops and software evaluations, prime farmland educational units, global environment workshops, and a water-safety kit for elementary students. Of special note was a cooperative training effort with the National Wildlife Federation—Conservation Learning Activities for Science and Social Studies. More than 1,000 teachers were trained to use this instructional source book. Major topics included energy use, environmental issues, forest/watershed management, hazardous substances, wetlands, and wildlife habitat management. An estimated 60,000 students will be reached by this program.

Budget: FY 84, \$.5 million; FY 85 estimate, \$.5 million.

VII: CORPORATE RESPONSIBILITY

As a federally-owned corporation, and as a major business enterprise in the Valley region, TVA carries out corporate responsibility to its employees and to its neighbors.

Health and Safety

Since 1981, when TVA had one of the poorest safety records of all Federal agencies, TVA's lost-workday rate has been improved by almost 80 percent and the severity rate of its on-the-job injuries has been reduced by about 70 percent.

As a result or renewed emphasis on the responsibility, authority, and accountability of line management, TVA's lost-workday and lost-time injury rates for fiscal year 1984 were lower than in any year since 1968.

Small Business Purchasing

TVA's efforts to develop systematic procedures for ensuring that small and disadvantaged businesses are afforded the opportunity to provide an increased share of the agency's procurement needs paid off dramatically in 1984.

Seventy-seven percent of all TVA's contracts and 24 percent of all contract dollars went to small businesses in 1984. These contracts with small, often family-owned businesses numbered more than 56,000 and represent a dollar value of about \$1.3 billion.

One of the most popular TVA service programs is the Home Weatherization Program, which in turn supports small businesses in a number of ways. About 95 percent of the 1,600 contractors participating in the program are small businesses. A recent survey of major weatherization manufacturers revealed that 80 to 90 percent of the insulation materials sold and installed in the Valley region are for the Home Weatherization Program.

Many other TVA programs also aid small businesses by offering or purchasing products and services.

In-Lieu-of-Taxes

TVA in-lieu-of-tax payments to States and counties were \$170 million in 1984. These payments are equal to five percent of the gross proceeds derived from the sale of electricity for the previous year, excluding sales to Federal agencies. Municipal and cooperative distributors of TVA power paid \$59 million during their fiscal year, which ended June 30, 1984. A total of \$229 million was paid to State and local governments from TVA and local power distributors. The agency also paid \$114 million to the U.S. Treasury in 1984, in repayment and return on the Federal appropriations invested in TVA power facilities before 1959 self-financing legislation authorized TVA to sell power bonds and notes to obtain capital.

The total appropriated budget for general services in FY 84 was \$6 million. Estimated budget for FY 85 is \$8.7 million.

SENATOR WENDELL H. FORD

SUBCOMMITTEE ON
REGIONAL AND COMMUNITY DEVELOPMENT
COMMITTEE ON ENVIRONMENT & PUBLIC WORKS

JULY 16, 1985

Mr. Chairman:

It is a pleasure to appear before you this morning in conjunction with my distinguished colleagues to discuss the Tennessee Valley Authority. I appreciate your providing this forum so that we can discuss the merits of this unique, sometimes misunderstood, but extremely valuable institution.

As former Lieutenant Governor, then Governor, and now Senator these last ten years from the Commonwealth of Kentucky, I am here to tell you from first-hand experience of the great contribution TVA has made not only to my state but to the South -- and, indeed, to the Nation.

For over a half a century, TVA has demonstrated the success of its unified resource development program, incorporating the judicious use of natural resources, sensitivity to the environment, innovative approaches to economic and community development, groundbreaking scientific research, and the provision of electric power at reasonable rates. TVA's economic, agricultural, and fertilizer

development programs have done much over the years to increase per capita income among Valley residents. Since the per capita income in the Valley was about half the national average 50 years ago, there can be no question as to the value of TVA's contribution. Yet, the job is still unfinished -- per capita income has recently slipped back to less than 80 percent. TVA remains the principal federal entity in the area able to deliver the kind of broad-gauge technical assistance that can help bring the region fully into the mainstream of the American economy.

But there is a broader and, in many respects, more significant dimension of TVA that should not be overlooked in a discussion of the more local and familiar. TVA is a national laboratory, a testing-ground, that benefits all citizens of this Nation. This was clearly President Franklin Roosevelt's conception when TVA was created in 1933, and it has been strengthened by the philosophy and actions of the TVA Board members.

In the testimony that you received yesterday and that you are hearing today you have been given numerous examples of TVA's role as a national laboratory. In two such activities in Kentucky, which I am going to discuss in detail, the major beneficiaries are the people of the United States wherever they may reside.

These two programs belie OMB's assumption that TVA is little more than a regional power producer whose nonpower programs duplicate the national programs of other federal agencies, and exemplify what TVA is really all about. They are the recreation and education facility known as Land Between the Lakes, and TVA's world respected work in the field of atmospheric fluidized bed combustion.

LAND BETWEEN THE LAKES

TVA's Land Between the Lakes (LBL) is a 170,000-acre facility with over 300 miles of undisturbed shoreline that is located in western Kentucky and Tennessee. LBL is the second largest contiguous public land area east of the Mississippi (only the Great Smoky Mountains National Park is larger) and is within a day's drive of over 75 million Americans. Last year over 2 million visitors from all 50 states and 20 foreign countries came to LBL.

LBL is the hub of a \$150 million tourism industry in Kentucky. In 1984, LBL visitors contributed \$45 million to the local economy and created an estimated 2,000 full-time jobs. LBL has also been a magnet drawing additional public and private investment to western Kentucky. For example, its

existence was a major influence on the Commonwealth's decision to build the multimillion dollar Lake Barkley State Resort Park near an LBL main entrance.

But LBL is more than the single most important recreation spot in Kentucky. It is also a national demonstration facility that tests innovative approaches to resource management, scientific research, and education. These innovations are currently providing benefits to both Kentucky and the Nation.

-- Successful programs at LBL are restoring the once native bald eagle and other birds of prey to the wild.

-- LBL's education programs provide hands-on training for hundreds of professionals and students in the fields of resource management, recreation, and environmental education. These students, some 800 to date, have come from universities from California to Maine.

-- The National Science Foundation named LBL as part of the national experimental ecological reserve network, making it one of 96 sites (only one of two sites on a major reservoir) selected for long-term field research projects.

-- Kentucky is one of two States without a National Wildlife refuge, but LBL helps fill this critical need.

-- LBL and the University of Kentucky have developed an outdoor education training program for those who work with the handicapped. This program has already spread to 12 southeastern States and the District of Columbia.

-- In cooperation with USDA and the US Army, LBL and TVA played an instrumental role in the development of an effective chemical control agent now used Nation-wide for ticks -- a major nuisance and public health problem throughout the United States.

-- Because of its unique resource management program, LBL is part of an international training program for government natural resource officials from less developed countries (primarily African and South American nations).

These representative examples clearly show that LBL is far more than just another "national park." It is currently contributing in a wide range of areas that have international and national, as well as local, application.

ATMOSPHERIC FLUIDIZED BED COMBUSTION PROJECTS

Another case of TVA leadership is its demonstration of Atmospheric Fluidized Bed Combustion (AFBC) as a power generation option for electric utilities. This advanced coal burning process uses more abundant and less costly high-sulfur coals (including Kentucky coal) in an environmentally

acceptable manner. Such coal has limited use in conventional power plants at this time due to environmental standards, as you well know.

As the Nation's largest supplier of electricity, with experience gained in the operation of fossil facilities, TVA is in an excellent position to demonstrate AFBC technology to the utility industry. TVA took its first steps in 1979, with the support of the federal government, in developing this technology for the Nation's utility industry by constructing a 20-MW AFBC pilot plant located on the TVA Shawnee Steam Plant site in Paducah, Kentucky. This plant is the largest AFBC unit to operate under utility conditions and, since its startup, has operated over 10,000 hours and consumed approximately 59,000 tons of high-sulfur Kentucky coal.

Based on the successful operation of this pilot facility, TVA has embarked on an even more significant demonstration -- the planned replacement of one of its existing pulverized coal boilers at the Shawnee Steam Plant with a 160-MW AFBC boiler. The proposed replacement of an existing boiler with an AFBC unit is particularly significant to the electric utility industry, since retrofitting existing steam generation units with AFBC boilers is a likely initial application of this advance technology.

The utility, coal, railroads and other industries have recognized the national importance of this project, and only \$30 million of the project's estimated \$220 million cost will be provided by federal taxpayers. The remaining funds will be provided by revenues from TVA's self-financing power system, the Electric Power Research Institute, the Commonwealth of Kentucky, Duke Power Company, Combustion Engineering, other utility companies, major coal producers, and railroad companies.

Because of TVA's pioneering program, AFBC coal-fired plants are expected to be an available alternative to more traditional coal-fired plants with scrubbers in the mid-1990s. This technology is particularly important to coal-producing states like Kentucky, electric utilities, and the consumers of electric power, since AFBC plants have numerous advantages when compared to more traditional coal-fired plants with scrubbers. For example, AFBC plants

- are projected to be between 10 and 15 percent less costly to build than conventional coal-fired plants with scrubbers and 5 to 10 percent cheaper to operate;

- burn a variety of less costly fuels and do not require expensive pollution control devices (unlike new conventional coal-fired plants with scrubbers);

-- may be one of the best long-term solutions to reducing sulfur emissions;

-- produce dry waste by-products that may be disposed of in a safe and environmentally acceptable manner and which have potential uses in agricultural and industrial applications;

-- hold the promise, as a new (rather than fully mature) technology of further significant refinements in the future;

-- would help the Nation achieve energy independence and reduce its balance of payments problem by permitting electric utilities to burn more domestic fuels;

-- would contribute to the worldwide reduction of pollution, since many foreign countries have vast reserves of low-grade coals; and

-- would create a market for 50 to 100 million tons of high sulfur coal by the year 2000 if AFBC generating capacity reached 3-6.5 percent of total domestic electric generation.

By serving as the catalyst in a much needed high tech research, development and demonstration project that has immediate commercial application, TVA is demonstrating that technical expertise, innovative ideas, and highly leveraged

federal funds can be blended in a public-private sector partnership which benefits all Americans.

Mr. Chairman, in this year when Congress is making a concerted effort to come to grips with the \$200 billion deficit that is facing this Nation, we are all willing to sustain our fair share of budget cuts. But a 70% reduction is neither fair nor is it sharing. A cut of this magnitude would cause severe economic hardship to western Kentucky and the rest of the Valley states. It would deprive these states of a tried and true system of resource management, leaving a gap that would have to be filled by other federal agencies and that would, quite frankly, not be filled as efficiently or as competently. It would create substantial unemployment in a region that already earns less than the national average income. But the Nation would be a loser, too, a big loser, if TVA were to be reduced to no more than a power-generating operation. We cannot allow this to happen.

I ask that the following material be placed in the printed record at the end of my statement:

-- Senate Resolution No. 15 adopted by the Kentucky Senate on January 10, 1985, urging rejection of OMB's recommendation that the TVA budget be reduced to \$38 million;

-- Statement of G. Wendell Combs, Secretary of the Kentucky Tourism Cabinet, before the Senate Appropriations Subcommittee on Energy and Water Development on April 1, 1985, discussing the impact of the proposed TVA budget cut on the Commonwealth;

-- Resolution of the Kentucky Flood Control Advisory Commission regarding the TVA floodplain management program;

-- Letter from Raymond M. Burse, President of Kentucky State University, describing the effect the proposed cut would have on 1890 Land Grant Institutions throughout the Tennessee Valley region;

-- Letter from the Sierra Club expressing detailed concern that TVA's mission to conserve the natural resources and protect the environment of the Tennessee Valley cannot be adequately accomplished subsequent to a drastic budgetary cut.

MRS. MARJORIE WAGONER

CHIEF CLERK

STATE SENATE

ROOM 319 STATE CAPITOL

FRANKFORT, KENTUCKY

40601



COMMONWEALTH OF KENTUCKY

STATE SENATE

FRANKFORT, KENTUCKY

January
Eleven
1985

Senator Wendell Ford
SR 173A Russell Senate Office Building
Washington, D. C. 20510

Dear Senator Ford:

Attached is a copy of Senate Resolution No. 15 which was introduced and adopted by the Kentucky Senate on January 10, 1985.

This resolution is urging President Ronald Reagan to reject the recommendation of David Stockman, Director of the Office of Management and Budget, that the budget for the Tennessee Valley Authority be reduced from 135 million dollars to 38 million dollars.

As directed, copy of this resolution is being forwarded to you for your consideration.

Sincerely,

Marjorie Wagoner

(Mrs.) Marjorie Wagoner
Chief Clerk of the Senate

Attachment

IN SENATE

ORGANIZATIONAL SESSION 1985

SENATE RESOLUTION NO. 15

THURSDAY, JANUARY 10, 1985

Senators Helen Garrett, Charles Gregory Higdon, Henry Lackey, and William L. Quinlan introduced the following resolution which was ordered to be printed.

A RESOLUTION urging President Ronald Reagan to reject the recommendation of David Stockman, Director of the Office of Management and Budget, that the budget for the Tennessee Valley Authority be reduced from 135 million dollars to 38 million dollars.

WHEREAS, the reduction in the TVA budget represents a savings of 97 million dollars within the context of the federal budget, yet in reality a budget cut of such magnitude is no savings at all because this budget cutting would eliminate TVA programs which are the seedbed for millions of dollars being produced within the private sector; and

WHEREAS, one example of such a phantom savings would occur should the 7 1/2 million dollar TVA program for management of the Land Between The Lakes in Western Kentucky be eliminated; and

WHEREAS, funding for the Land Between The Lakes generates a large portion of the private sector dollars for the Western Kentucky counties of Graves, McCracken, Calloway, Marshall, Livingston, Crittenden, Lyon, Caldwell, Trigg, and Christian, the adverse impact from the loss of the 7 1/2 million dollars for the Land Between The Lakes will be greatly disproportionate to the savings made in the federal budget; and

WHEREAS, the TVA management of the Land Between The Lakes attracts 2,100,000 tourists annually, directly

employs three-hundred individuals, creates 1800 jobs within the region, maintains the natural resources where hunters and fishermen spent 6.8 million dollars in 1984 and where photographers and others spent 2.8 million dollars in 1984, and lastly, provides a focal point for a 150 million dollar tourist industry extending for a 200 mile radius beyond the Land Between The Lakes; and

WHEREAS, the economic life created within the region by the TVA funding for the Land Between The Lakes has even greater importance when it is realized that the major industry of Western Kentucky has slumped since 1970 when the western coal fields produced 52 million tons of coal but in 1983 only produced 34 million tons;

NOW, THEREFORE,

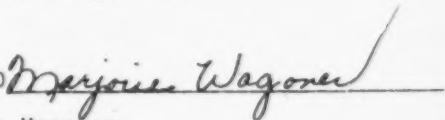
Be it resolved by the Senate of the General Assembly of the Commonwealth of Kentucky:

1 Section 1. That the Senate of the Commonwealth of
2 Kentucky urges President Ronald Reagan to reject the
3 recommendation that the budget of the Tennessee Valley
4 Authority be reduced from 135 million dollars to 38 mil-
5 lion dollars because the elimination of the 7 1/2 million
6 dollar program for the Land Between The Lakes in Western
7 Kentucky will ultimately be more costly to the federal
8 government than funding the program.

OS 85 BR 25

- 1 Section 2. That this resolution be sent to Presi-
2 dent Ronald Reagan, Director David Stockman, and the mem-
3 bers of the Kentucky Congressional Delegation.

ATTESTED

A handwritten signature in cursive script, reading "Marjorie Wagoner", is written over a horizontal line.

Marjorie Wagoner
Chief Clerk of the Senate

STATEMENT OF
G. WENDELL COMBS
SECRETARY OF THE
KENTUCKY TOURISM CABINET
BEFORE THE
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
COMMITTEE ON APPROPRIATIONS
U.S. SENATE
APRIL 1, 1985

Good morning, Mr. Chairman and members of the Committee. I am Wendell Combs, Secretary of the Kentucky Tourism Cabinet. In that capacity, I oversee five state agencies which promote Kentucky as a travel destination and protect and preserve Kentucky's natural attractions. Among the agencies in the Kentucky Tourism Cabinet are our state park system and the Kentucky Department of Fish and Wildlife Resources.

Thank you for the opportunity to be here today to offer my perspective on the proposed reductions in the Tennessee Valley Authority budget. Because of my interest in economic development, in particular as it relates to tourism, I find the impact of these proposed cuts of great concern.

Let me begin by establishing the economic importance of tourism. Tourism is one of our nation's fastest growing industries. It is currently sustaining a 4 percent real growth rate annually and is predicted by many to become our number one industry by the year 2000. In Kentucky, tourism is currently our fourth largest industry and is quickly gaining on other segments of our economy. Tourism accounted for \$2.28 billion in total expenditures in Kentucky's economy in 1983.

Today, I will explain the national significance of TVA managed recreation areas and detail the economic impact that will result if funding for these important tourism projects is eliminated. Excluded from this budget is funding for 50 public use facilities and 10 small wild areas in the seven TVA states, a tourism development program, and Land Between the Lakes. Loss of any of these projects would be detrimental, but the closure of Land Between the Lakes would be devastating to Kentucky's tourism economy and to the entire nation's recreational opportunities. Land Between the Lakes is a national demonstration area. Located in the western Kentucky counties of Lyon and Trigg and Stewart County in Tennessee, it is a 170,000 acre peninsula between TVA's Kentucky Lake and the Corps of Engineers' Lake Barkley.

Let me now detail the national significance and economic impact of TVA managed recreation and explain why continued federal funding is required.

NATIONAL SCOPE OF LAND BETWEEN THE LAKES

Because Land Between the Lakes is primarily in western Kentucky, it has an enormous impact on the economy of that area. But Land Between the Lakes is by no means just a regional attraction. People from all 50 states and 20 foreign countries visited Land Between the Lakes in 1984 according to TVA visitor counts.

As a national demonstration area, a part of Land Between the Lakes' mission is to provide training to pre-professional and practicing professionals about resource management for a recreation area. These programs attract nationwide participation and spread the impact of resource management techniques developed at Land Between the Lakes to recreational facilities throughout our nation. According to TVA reports, in 1984, 74 intern students from 40 universities were trained at Land Between the Lakes; over 400 students from 23 universities were trained in professional development programs; and professional development workshops were conducted for a number of groups such as the New York Department of Environmental Conservation, Arkansas Department of Parks and Tourism, and the Tennessee Department of Conservation.

In addition, wildlife management programs at Land Between the Lakes have national significance. For example, the bald eagle hacking program at Land Between the Lakes resulted in the first successful eagle nest in the area since the early 1940's. This effort, in cooperation with state, federal, and volunteer agencies, has had a positive impact on eagle restoration efforts in the south.

ECONOMIC IMPACT

Land Between the Lakes is the major attraction not only for the western part of the state, but for Kentucky as a whole. It draws more visitors annually than any other attraction in Kentucky. Last year, over 2.1 million visitors traveled to Land Between the Lakes and they made a contribution to Kentucky's economy of over \$45 million.

Land Between the Lakes' tax impact further demonstrates its importance. The expenditures of the tourists to Land Between the Lakes generate over \$3.1 million in annual state and local taxes within Kentucky.

This attraction is also a major contributor to employment in Kentucky. The expenditures of the tourists to Land Between the Lakes generated 2,022 jobs for Kentuckians in 1984. If Land Between the Lakes closes, 300 jobs will be lost with 1,800 more lost after a short period of time.

The Kentucky Tourism Cabinet conducted research to develop the above information. We developed an input-output model specifically for the Kentucky tourism industry and gathered data for this research through visitor surveys. These figures generally are conservative when compared with similar studies, such as those available through the U.S. Travel Data Service.

FEDERAL AND STATE INVESTMENT

Much federal and state money has gone into the development of Land Between the Lakes and the lakes region of Kentucky. Through 1983, TVA had invested \$76 million into Land Between the Lakes development--\$34 million for land acquisition, \$42 million for facilities. About two hundred Kentucky citizens had to relinquish their land to allow for the development of Land Between the Lakes.

Also, Kentucky has invested in development in the lakes region adjacent to Land Between the Lakes. One of the benefits postulated in the original Land Between the Lakes concept was that the development of Land Between the Lakes would lead to development of the lakes region from outside interests. The Commonwealth of Kentucky prescribed to this philosophy and developed three state resort parks in the lakes area. With a combined fixed asset value estimated at \$20.5 million and a much higher replacement value, these three Kentucky state parks, Kenlake, Lake

Barkley, and Kentucky Dam Village, represent a major state investment in the Land Between the Lakes concept. These three parks serve visitors from throughout the United States and foreign countries. Nearly 46 percent of the overnight visitors resided outside Kentucky. These parks serve as a recreation resource for the nation as a whole, as well as for the residents of other countries. If Land Between the Lakes closes, the Commonwealth of Kentucky has concern about the future of these three resort parks.

STATE COOPERATION WITH TVA

The states provide support to TVA's management of Land Between the Lakes. Kentucky currently assists Land Between the Lakes with law enforcement and wildlife management.

In turn, Land Between the Lakes staff have assisted the states with wildlife restoration programs. The thriving turkey population at Land Between the Lakes is the source for statewide turkey restoration programs in both Kentucky and Tennessee. In addition, Land Between the Lakes staff worked cooperatively with officials from Kentucky's Department of Fish and Wildlife Resources to initiate a ruffed grouse restoration program. Other joint projects between TVA staff and Kentucky have included fisheries projects and the placement of lake brush attractors.

IRREPLACEABLE FEDERAL AREA

If Land Between the Lakes closes, another area of this significance would not be available to replace it. Land Between the Lakes is the second largest contiguous federal ownership east of the Mississippi River, and little federal acreage is available for public use in the eastern portion of the nation. Located within a day's drive of over 75 million people, Land Between the Lakes has an excellent location for a public use recreational facility.

TVA established Land Between the Lakes as a national demonstration in recreation, resource development and environmental education. That is a unique mission for a federally held property and is only possible because of the integrated resource management allowed by TVA's management of the area. Other federal lands do not presently have this scope of resource utilization.

INTEGRATED RESOURCE MANAGEMENT

In 1963, when President John F. Kennedy announced that TVA would develop Land Between the Lakes, he charged TVA with the mission to manage all the resources of the area to produce the most favorable possible environment for outdoor recreation. Land Between the Lakes, a national demonstration in recreation development, then also became an exercise in integrated resource management. This has led to its development as an area where hunting, campgrounds, attractions, wildlife management, and environmental education all exist side by side under the management of a single agency.

If funding for Land Between the Lakes is eliminated under TVA's budget, other federal agencies, which have primarily single-use philosophies, would not be able to maintain Land Between the Lakes as it is today. For example, if the National Park Service were to manage Land Between the Lakes, hunting would be eliminated. Hunting, fishing, and wildlife enjoyment are responsible for a large percentage of the visitation at Land Between the Lakes. Total visitors in these categories are estimated at about 700,000 each year. The expenditures by this group are estimated by TVA to be over \$10 million annually. Land Between the Lakes currently has over 200 days a year open for hunting waterfowl, deer, turkeys, raccoons, quail, squirrel and other game species and recorded 250,000 hunter visits last year.

Similarly, it is unlikely that other federal agencies such as the Forest Service or Fish and Wildlife could maintain Land Between the Lakes' broad spectrum of services which include such educational facilities as Homeplace 1850, a living-history farm similar to a working farm of the mid-19th century; Woodland Nature Center; Empire Farm, a contemporary living exhibition; and a planetarium.

OTHER TVA RECREATIONAL PROJECTS

Ten small, wild areas and 50 public use areas in the seven TVA states also fall under TVA management. TVA maintains camping and picnic facilities and protects unique environmental areas.

TVA also has a Tourism Development Program which provides local communities with assistance to plan and promote recreational development. Currently this program is helping with the development of recreational areas around the Tenn-Tombigbee Waterway and is working to attract three major resort developments to Mississippi. These are valuable services that cannot be obtained from another federal agency.

CONCLUSION

In conclusion, I would request that funding for TVA recreation projects continue. These are important tourism projects with effects beyond the seven TVA states.

As the primary recreation area, Land Between the Lakes demonstrates the success of the TVA tourism projects. TVA management has proved beneficial by providing integrated resource management and it is unlikely that another agency could maintain it as it is today or that a similar project could ever be developed in the eastern United States.

Elimination of funding for Land Between the Lakes would have a devastating effect upon the economy in western Kentucky. Kentucky has made a significant contribution to the recreational development of the area and can ill afford the destruction of over twenty years of progress.

Land Between the Lakes is a "national" project with visitors from all over the nation. A training program at Land Between the Lakes disseminates resource management techniques across the country. Closing Land Between the Lakes would result in a national loss.

I would like to urge that you continue funding Land Between the Lakes and other TVA recreational projects and maintain them in their present form under the able management of TVA.

I appreciate this opportunity to appear before the committee, and I will be happy to answer any questions you may have.

Thank you.

Stuart Brown
Chairman



1985 MAY 20 PM 3:47 The Layne Collins
Governor

COMMONWEALTH OF KENTUCKY
KENTUCKY FLOOD CONTROL ADVISORY COMMISSION

119 WEST BROADWAY
DEPOT PLACE
FRANKFORT KENTUCKY 40601
May 17, 1985

The Honorable Wendell Ford
United States Senate
173-A Russell Senate Office Bldg.
Washington, D.C. 20510

Dear Senator Ford:

The proposed federal budget submitted to Congress suggests drastic reductions in funding for the Tennessee Valley Authority, and the Soil Conservation Service; two programs that have a significant positive impact on the economy and ecology of Kentucky with an emphasis on the management and development of the State's water resources.

At the last meeting of the Kentucky Flood Control Advisory Commission, the Commission adopted two resolutions supporting continued funding for the two agencies. Of particular interest to the Commission are the agencies programs concerning technical assistance, flood control, and floodplain management which are vitally important to local governments in the Commonwealth in addressing their individual flooding problems.

The Commission is transmitting copies of the two resolutions to Kentucky's Congressional Delegation requesting support in continuing appropriations for the two agencies. Anything you can do to support the continuation of the two agencies and their programs that provide a much needed service to the Commonwealth will be appreciated.

Sincerely,

Stuart Brown

Stuart Brown
Chairman

Encls.

John R. Reed, Executive Director

Stuart Brown
Chairman



Martha Layne Collins
Governor

COMMONWEALTH OF KENTUCKY
KENTUCKY FLOOD CONTROL ADVISORY COMMISSION
119 WEST BROADWAY
DEPOT PLACE
FRANKFORT, KENTUCKY 40601

R E S O L U T I O N

TENNESSEE VALLEY AUTHORITY FLOODPLAIN MANAGEMENT
PROGRAM

- WHEREAS, the Tennessee Valley Authority technical floodplain management program reflects their responsibility for reducing flood damages in the Tennessee River Basin,
- WHEREAS, the Tennessee River Watershed covers 41,000 square miles and lies in part of seven states - Kentucky, Alabama, Georgia, Mississippi, North Carolina, Tennessee, and Virginia,
- WHEREAS, the Tennessee Valley Authority has put into practice many of the flood damage reduction techniques now used in floodplain management in Kentucky,
- WHEREAS, the Tennessee Valley Authority has assisted local communities in developing possible land use regulations and concepts for use in flood-prone lands, including flood-warning systems,
- WHEREAS, the Tennessee Valley Authority has planned and developed a number of structural and non-structural alternatives for reducing flood damages in Kentucky communities,
- WHEREAS, the Tennessee Valley Authority has provided technical assistance to ensure the understanding and proper use of flood hazard data, and flood damage reduction techniques to communities in need of such assistance,

John R. Reed, Executive Director

NOW THEREFORE, BE IT RESOLVED, that the Kentucky Flood Control Advisory Commission requests Kentucky's Congressional delegation to strongly encourage Congress to continue funding to the Tennessee Valley Authority for their technical floodplain management program which seeks solutions to flooding problems in the Tennessee Valley Region,

BE IT FURTHER RESOLVED, that copies of this Resolution be forwarded to the Kentucky Congressional delegation , and to the Governor of Kentucky.

April 2, 1985

Date

Stuart E. Brown

Stuart Brown, Chairman
Kentucky Flood Control Advisory
Commission



Kentucky State University

Frankfort, Kentucky 40601

Office of the President

January 10, 1985

The Honorable Wendell H. Ford
United States Senate
173A Russell Building
Washington, D.C. 20510

Dear Senator Ford:

As President of an 1890 Land Grant Institution, Kentucky State University, it has recently come to my attention, with great trepidation, that the Fiscal Year 1986 Tennessee Valley Authority (TVA) budget request for continued support of Agriculture, Economic/Community Development and Environmental Protection Programs has been deleted in total by the United States Office of Management and Budget in their FY 1986 Federal Budget allocations. At issue is the fact that the deletion from the FY 1986 TVA budget will connote the terminus of not only their Cooperative Agricultural Programs but also Economic/Community Development and Environmental Protection achievements gained through TVA. Farmers and the general public in Kentucky and other area states served by TVA have realized personal, community, state, regional and national returns from an important yet relatively small investment by the Federal Government. Indeed, new agricultural technologies (with other than regional impacts) have been developed and introduced and productivity and income have escalated, impoverished families have seen their nutritional levels improved due to TVA's home gardens and economic development programs. Further TVA Agricultural and Economic/Community Development activities have generated new employment opportunities and, of equal importance, have effected the retention and expansion of existing job resources.

The Tennessee Valley Authority is a critical supporter of educational institutions within its service area. In meeting its educational/demonstrational mandate, TVA focuses many agricultural and development programs through the Land Grant University system. Both 1890 and 1862 Land Grant Institutions would suffer a major loss in their Research and Cooperative Extension Programs should TVA Agriculture and Economic/Community Development and Environmental Protection Programs cease. Offering technical

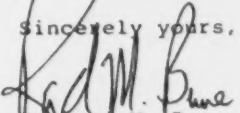
The Honorable Wendell H. Ford
Page 2
January 10, 1985

expertise, leadership and funding for demonstrations, TVA plays a vital role in the educational system. Together TVA and the Land Grant Institutions work to ensure that rural communities and small, low income farmers can remain a viable part of the agricultural economy and continue to pursue their chosen way of life.

It is my understanding that a Tennessee Valley Authority mandate, as defined by the United States Congress, is to enhance agricultural and related industries within the Tennessee Valley region. If the Office of Management and Budget proposal to eliminate the small allocations for the continuation of these excellent programs is accepted, all TVA cooperative agricultural development, environmental protection, economic/community development activities will cease September 30, 1985. In my opinion immediate impacts of such negative action will be detrimental in that agricultural production will be restricted, production and technology development and transfer in the Tennessee Valley region will be reduced, jobs will be forfeited and unemployment will rise in TVA program areas. Of greater importance are long run effects of reduced agriculture and economic output and the associated impacts in rural communities unemployment, and potentially, the economic failure of many low income farmers in the Tennessee Valley region. I believe the deletion of TVA Agriculture and Economic Programs would immediately increase Kentucky unemployment, reduce Kentucky agricultural output and technology transfer and reduce the chances for survival of many Kentucky small farms.

On behalf of Kentucky State University and the constituents we share, 1890 Land Grant Institutions throughout the Tennessee Valley region and their constituents and small farmers and their communities throughout the South, I would like to request your support in the reinstatement of the Agriculture and Economic/Community Development and Environmental Protection Programs of the Tennessee Valley Authority.

Sincerely yours,


Raymond M. Burse
President

xc: The Honorable Mark O. Hatfield
Mr. Curtis Brumitt

SIERRA
CLUB



SOUTHEAST OFFICE
P. O. Box 11248, Knoxville, TN 37939-1248

APPALACHIAN OFFICE
P. O. Box 727, Harpers Ferry, WV 25425

WASHINGTON, D. C., OFFICE
330 Pennsylvania Ave., SE, Washington, D. C. 20003

March 1, 1985

The Honorable Wendell Ford
United States Senate
173A Russell Senate Office Bldg.
Washington, D. C. 20510

Dear Senator Ford:

We would like to express our grave concern regarding the Reagan administration's current proposal to cut back the Tennessee Valley Authority's appropriated budget for FY 1986 by approximately 71%. We believe that TVA should accept its fair share of cutbacks in its appropriated budget for FY 1986 due to the deficit, but we strongly object to TVA being singled out for such a drastic cut while other federal departments are not called upon to bear such a burden. Since 1980 TVA has already accepted major budgetary cutbacks amounting to 39%, after inflation, in its appropriated budget. During this same period, the federal budget has grown by approximately \$349 billion.

We believe that such a proposed funding reduction for TVA would result in its destruction as an institution as mandated in the TVA Act of 1933. We are especially concerned that TVA's mission to conserve the natural resources and protect the environment of the Tennessee Valley cannot be adequately accomplished subsequent to such a drastic budgetary cut. The citizens of the Tennessee Valley are vitally dependent upon certain TVA programs to conserve and protect our natural resources. Sections 22 and 23 of the TVA Act provide a flexible mandate by which TVA has increasingly been able, through an interdisciplinary approach to river basin conservation and development, to address numerous problems, challenges, and opportunities of the Tennessee Valley and the nation. The problems have changed, but TVA can still address the environmental challenges of the 1980s.

The TVA environmental quality and natural resource conservation programs are unique in the Tennessee Valley. In fact, TVA has proved to be a vital resource in stimulating a greater consciousness among many state agencies and local and regional planning groups to utilize and be sensitive to environmental criteria in development decisions. The Conservation Foundation recently ranked the states regarding their provision of environmental legislation for the protection of their citizens' health and resources. The fact that Alabama ranked 50th, Mississippi 48th, and Tennessee 33rd should demonstrate the need for TVA's continued involvement

in encouraging a greater inclusion of environmental values and criteria by the Tennessee Valley state and local decision makers.

We are particularly concerned that the Reagan administration's current budget includes no funding for a number of important TVA conservation-related programs within the Office of Natural Resources and Economic Development. REGIONAL AIR MANAGEMENT program information provided by TVA has been helpful in identifying concentrations of particular air pollutants and in tracing their patterns throughout the Tennessee Valley. This has been especially important due to the fact that TVA is a large contributor of sulfur dioxide emissions in the Valley. This important recording of air pollution emission information will not be available if TVA is no longer funded to monitor and report it to the states and private enterprises. TVA's program addressed to ACIDIC PRECIPITATION is especially vital due to the fact that great portions of the Southern Appalachians are experiencing severe environmental problems with tree growth and survival greatly affected at upper elevations. The superintendent of the Great Smoky Mountains National Park has stated that acidic precipitation is one of the greatest external threats to the Great Smoky Mountains National Park, America's most used national park. The TVA board has recognized that TVA's power operations play a role in that problem. Their efforts to address the problem for the nation should not be stifled by an administration which talks about the need for acid rain research then refuses to fund it.

We also believe that the ARCHAEOLOGICAL INVENTORY of 4,000 acres of TVA reservoir lands is an important activity in this archaeologically rich area. As you know, development projects can bring severe stresses upon our historic and cultural heritage. TVA has an outstanding cultural resources staff who, like their counterparts dealing with the protection of natural areas, has worked to mitigate and preserve important parts of the cultural heritage of the Tennessee Valley. They have also fostered complementing activities at the state level. The Tennessee Valley contains some of the most significant archaeological sites in North America. For example, Seven Mile Island, a linear island in Pickwick Reservoir near Florence, Alabama, dates its cultural history some 10,000 years and is one of the foremost paleolithic sites on this continent. TVA has to date worked to protect that and other sites and is seeking to inventory others which may be of equal significance.

TVA's natural resources programs for the land and forest resources have also been proposed for total elimination. TVA has utilized these programs to manage 15,000 acres of dewatering areas on TVA reservoir lands in cooperation with the Valley states and the U. S. Fish and Wildlife Service in protecting approximately 4,000 acres of bottomland hardwood timber, wintering over a half million ducks and geese and sustaining about 60 endangered bald and golden eagles. The resulting direct economic benefits from these WILDLIFE RESTORATION AND HABITAT IMPROVEMENT programs

amount to approximately \$2.5 million annually. The Tennessee Valley is facing significant developmental pressures particularly along riverine wetland and other ecologically sensitive areas, resulting in the annual loss of wildlife habitat to urban uses amounting to over 100,000 acres per year. Without TVA's efforts, it is doubtful that the states would be able to bring their fish and wildlife programs as far as they have or to replace the contributions that TVA is making in these areas.

TVA's programs in ENVIRONMENTAL EDUCATION in schools are absolutely essential if there is to be environmental education in the schools in the Tennessee Valley. Many of the TVA environmental education programs are directed toward out-of-school citizens as well as students and serve as a significant contributor to citizen understanding of the importance of ecological values.

The lands and waters associated with TVA's reservoirs are experiencing an estimated 70 million visits annually. These visits are also expected to increase by 10 million during the 1980s. There are a dearth of municipal, county, and state parks in this region. The Tennessee Valley is heavily dependent upon the recreational opportunities provided by TVA. The quality of life for many of our citizens in the Valley would be greatly affected should the quality and level of services provided by the TVA VISITOR RECREATION programs be eliminated. An elimination of the operation of TVA's 26 reservoir campgrounds, 62 day use and informal recreation areas, 10 trails and 23 boat launching ramps would also do irreparable harm to the Tennessee Valley so dependent on tourism as an important economic base.

TVA's LAND BETWEEN THE LAKES multiple-use demonstration combining environmental education with stewardship of the land and recreational experiences is a unique facility unlike any other in America. TVA's ability to bring its combined talents to bear on natural and cultural resource heritage preservation should justify retaining funding for all functions associated with the management of its programs and its 170,000 acres of land.

Among other TVA programs within TVA's Office of Natural Resources and Economic Development targeted for elimination and of special concern to us is the TRANSPORTATION/RIDESHARING programs whose staff has proposed over 60 additional van pool startups over the next three years which would reduce the amount of auto pollutants by over 200 tons. The SOLID AND HAZARDOUS WASTE MANAGEMENT and WASTEWATER AND WATER SUPPLY OPERATION activities have served to demonstrate advanced solid and hazardous waste and water supply management practices.

There are also programs in other TVA offices which address conservation issues and are regrettably proposed for extinction. Within TVA's Office of Agricultural and Chemical Development, the agricultural resource development operation is proposed for total dissolution. Among the most valuable programs in that office

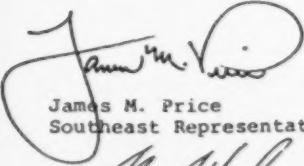
is the FARMLAND PROTECTION program which works with state governments and citizen organizations to protect and preserve prime agricultural lands, which account for 17% of the lands in the Tennessee Valley. Western Tennessee, Northwest Alabama, and Northeast Mississippi have some of the worst soil erosion problems in America. TVA's multi-state approach, through its valley-wide SOIL AND WATER CONSERVATION program on 210 resource management conservation farms and 250 demonstrations of no-till conservation farming, are providing a valued national contribution in promoting the conservation of vital soils. TVA's 12,000 HOME GARDEN DEMONSTRATIONS, each generating over \$600 worth of food for low-income families, reflects volunteerism at its best, and has served as a national model for other organizations. Similar valued activities are occurring through the MARKET DEVELOPMENT program whereby the optimal crops of small family farmers are matched with appropriate markets. These types of services are not reaching Valley citizens from any other source.

This letter does not profess to have included every TVA program of value to us which has been targeted for elimination by the Reagan administration. Other programs, such as the RESERVOIR LAND PLANNING program, have also been proposed for funding but at levels insufficient to allow the staff to provide the participatory approaches to land management planning which should be provided. All of these programs, from RESEARCH AND DEVELOPMENT TO INCREASE THE DISSOLVED OXYGEN CONTENT IN WATERS BELOW HYDRO-ELECTRIC DAMS to the DEVELOPMENT OF COMPREHENSIVE RESERVOIR WATER QUALITY MANAGEMENT PLANS to FLOOD HAZARD ANALYSES to STREAM ACCESS LAND ACQUISITION programs reflect the diversity of talents which TVA can bring to bear on environmental problems. In the early 1930s, those problems centered around flooding and health service inadequacies of a mosquito-infested valley. Today the Tennessee Valley faces new and perhaps more complicated environmental challenges from hazardous waste issues to groundwater problems. TVA has the unique capability to bring its resources to bear in a way that no other single public or private enterprise can to address these issues, but it cannot if it is destroyed. If the current Reagan administration budget proposal is not overruled, TVA's mandate will be destroyed without the administration touching the TVA Act. TVA's mission will be reduced to a whimper, and its chances for contributing to the future of the Valley and the nation will be foregone. We hear a lot these days about how we need a strong national defense. We would assert that a strong environment and a strong economy are compatible and are as important to our national security as is a large-standing army with warehouses of powerful armaments.

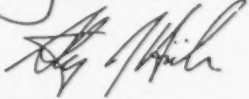
We believe that the Tennessee Valley Authority has made significant strides through its natural resource conservation and environmental quality programs in the last decade. We intend to stand by those people in TVA who are standing up for the environment. We hope you will, too. We believe that TVA as a mechanism has not outlived its usefulness. TVA can address the environmental problems of this new era. We hope you will agree with us that the people at TVA deserve a chance to continue their momentum

toward addressing them. We urge your support for the fair budgetary restoration of these TVA programs and others which you see as being reflective of a sensitivity to the environment and the exercise of wise stewardship of our valued natural and cultural resources.

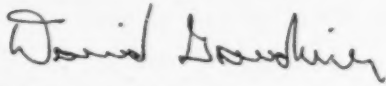
Sincerely,



James M. Price
Southeast Representative



Steve Hiniker
Appalachian Representative



David Gardiner
Legislative Director

mw

HEARINGS ON
THETENNESSEE VALLEY AUTHORITY
SENATOR GORDON HUMPHREY
SUBCOMMITTEE CHAIR
JULY 15, 1985

Corinne Whitehead

May I express my complete opposition to the "privatizing" of the Tennessee Valley Authority. I am a former resident of the "Land Between the Lakes" and I resent like hell, the fact that our property was taken, however the idea of selling the land off in blocks to the highest bidder at this point, makes me sick. The greatest problems with TVA and the citizens of the Valley were during the years when special interests controlled the Board, I can only assume for their own profit,

The people of the Tennessee Valley are aware that they must have an input into the selection of the members of the TVA Board. A Coalition of some 47 organizations in the region and nationally have taken the precaution to monitor the qualifications and merits of the last several Board appointments and will ^{be} sure, continue in the years to come.

The Tennessee Valley Authority should be funded by the Congress so the technical assistance and educational programs can be provided for the many communities who need them desperately. For instance we need water quality studies in this area where the cancer rate is terrible. We need high technology hazardous waste demonstration projects in most of the seven states and educational programs in waste management for all of the communities.

I have absolutely no criticism of the management of the agency under the present three member Board of Directors. Beginning with the tenure of David Freeman, the Tennessee Valley Authority fiscal management has changed dramatically for the better.

Statement of
SENATOR THAD COCHRAN

Before the
SUBCOMMITTEE ON REGIONAL AND COMMUNITY DEVELOPMENT

July 16, 1985

MR. CHAIRMAN, I APPRECIATE THE OPPORTUNITY TO TESTIFY TODAY AT THIS HEARING ON THE TENNESSEE VALLEY AUTHORITY.

FOR MORE THAN 50 YEARS, THE TENNESSEE VALLEY AUTHORITY HAS MADE A SIGNIFICANT INVESTMENT OF FINANCIAL AND HUMAN RESOURCES IN THE STATE OF MISSISSIPPI. TVA'S COMMITMENT OF RESOURCES IN MISSISSIPPI FOR 1985 INVOLVES 181 EMPLOYEES WITH AN ANNUAL PAYROLL OF MORE THAN \$4.8 MILLION.

MOST IMPORTANTLY, TVA HAS HELPED MAKE THE STANDARD OF LIVING BETTER FOR OUR RURAL COMMUNITIES BY PROVIDING AN ADEQUATE AND RELIABLE SUPPLY OF ELECTRICITY TO RESIDENTS OF 36 MISSISSIPPI COUNTIES. BUT, IN ADDITION TO PROVIDING THESE ESSENTIAL POWER AND ENGINEERING SERVICES, TVA ACTIVITIES IN OTHER PROGRAM AREAS CONTINUE TO PROVIDE IMPORTANT CONTRIBUTIONS TO MISSISSIPPI THROUGH ECONOMIC AND AGRICULTURAL DEVELOPMENT PROGRAMS.

TVA WORKS WITH STATE AND LOCAL GOVERNMENTS, OTHER FEDERAL AGENCIES, AND THE PRIVATE SECTOR TO PROMOTE ECONOMIC GROWTH WHILE ENHANCING THE QUALITY OF THE VALLEY'S NATURAL RESOURCES AND ENVIRONMENT. TVA'S TOTAL BUDGET FOR NATURAL RESOURCES AND ECONOMIC DEVELOPMENT IN FISCAL YEAR 1985 IS \$70 MILLION. APPROXIMATELY \$5.3 MILLION OF THESE FUNDS WILL BE SPENT IN THE STATE OF MISSISSIPPI FOR COMMUNITY PREPAREDNESS AND ECONOMIC DEVELOPMENT IN 37 MISSISSIPPI CITIES AND COUNTIES.

TVA'S SPECIAL OPPORTUNITIES COUNTIES AND CITIES (SOCC) PROGRAM IS AIMED AT ASSISTING THE MOST ECONOMICALLY DEPRESSED AREAS IN THE VALLEY. CURRENTLY, THE PROGRAM INVOLVES PROJECTS IN 17 MISSISSIPPI COUNTIES.

IN 1985, \$400,000 OF TVA FUNDS WILL BE SPENT TO CONSTRUCT A BUILDING IN THE KEMPER COUNTY INDUSTRIAL PARK. OTHER FUNDS WILL BE USED TO PROVIDE TECHNICAL ASSISTANCE TO THE STARKVILLE INDUSTRIAL PARK AT MISSISSIPPI STATE UNIVERSITY FOR RECRUITING AND INCUBATING RESEARCH AND TECHNOLOGY-ORIENTED FIRMS. TVA'S ACTIVITIES IN THE TENNESSEE-TOMBIGBEE CORRIDOR DEMONSTRATION WILL FOCUS ON THE TRANSPORTATION ADVANTAGE OF THE TENNESSEE-TOMBIGBEE WATERWAY TO EXPAND MARKETS FOR WOOD PRODUCTS.

TVA'S EFFORTS TO ENHANCE THE QUALITY OF THE VALLEY'S NATURAL RESOURCES ARE ALSO EVIDENT IN OUR STATE. A COMPREHENSIVE WATER SUPPLY PLANNING EFFORT INVOLVING 80 SMALL SYSTEMS IN ALCORN, BENTON, PRENTISS, TIPPAAH, TISHOMINGO AND UNION COUNTIES WILL BE CONDUCTED IN 1985 TO DEVELOP DEPENDABLE COMMUNITY/INDUSTRIAL WATER SUPPLIES. A NORTH MISSISSIPPI ENVIRONMENTAL/ENERGY EDUCATION CONSORTIUM HAS BEEN FORMED TO SERVE CLAY, LOWNDES, AND OKTIBBEHA COUNTIES, AND THE JACKSON STATE CENTER FOR ENVIRONMENTAL/ENERGY EDUCATION WILL ALSO RECEIVE SUPPORT FROM TVA FUNDS.

IT IS DIFFICULT TO CONCEIVE OF MISSISSIPPI'S AGRICULTURAL PROGRESS WITHOUT DISCUSSING THE CONTRIBUTIONS OF TVA. FROM ITS VERY BEGINNING, TVA HAS WORKED WITH LAND-GRANT UNIVERSITIES, U. S. DEPARTMENT OF AGRICULTURE AGENCIES, AND STATE AND LOCAL ORGANIZATIONS TO HELP INCREASE AGRICULTURAL PRODUCTIVITY AND INCOME, AND TO BOLSTER THE VALLEY'S OVERALL ECONOMY. THESE COMBINED EFFORTS HAVE HELPED USHER IN A NEW ERA IN FOOD PRODUCTION AND SOIL CONSERVATION.

THE NATIONAL FERTILIZER DEVELOPMENT CENTER AT MUSCLE SHOALS, ALABAMA, IS THE NATION'S ONLY INSTITUTION FOR CREATING NEW FERTILIZERS AND PRODUCTION TECHNOLOGY. ABOUT 75 PERCENT OF TODAY'S FERTILIZERS WERE CREATED OR

PROCESSES FOR THEIR PRODUCTION WERE IMPROVED AT TVA. TWENTY FERTILIZER DISTRIBUTORS AND DEALERS COOPERATE IN THIS PROGRAM IN MISSISSIPPI, AND THEY USE ABOUT 5,500 TONS OF TVA EXPERIMENTAL FERTILIZERS TO HELP CREATE MARKET ACCEPTANCE AND INDUSTRY ADOPTION OF THE IMPROVED PRODUCTS.

TVA'S ASSOCIATION WITH USDA AND EACH OF THE AGRICULTURAL COLLEGES IN THE SEVEN VALLEY STATES HAS SOUGHT TO COMBINE THE BEST EACH COULD OFFER IN PLANNING UNIFIED AGRICULTURAL PROGRAM FOR THE TENNESSEE VALLEY REGION. TVA AND MISSISSIPPI STATE UNIVERSITY WORK WITH ABOUT 20 WHOLE-FARM TYPE DEMONSTRATIONS TO HELP IMPROVE FARM INCOME BY INTRODUCING NEW TECHNOLOGY, FARM MANAGEMENT TECHNIQUES, SOIL AND WATER CONSERVATION PRACTICES, AND MARKETING INNOVATIONS. ABOUT 15 MEMBERS OF THE STAFF OF MISSISSIPPI STATE UNIVERSITY EXTENSION SERVICE ARE EMPLOYED WITH TVA FUNDING TO CONDUCT THE COOPERATIVE PROGRAM.

TVA IS ALSO COOPERATING WITH SEVERAL STATE AGENCIES IN AN ACCELERATED PROGRAM TO REDUCE SOIL EROSION, IMPROVE WATER QUALITY, AND INCREASE FARM INCOME. CONSERVATION FARMING SYSTEMS ARE BEING INTRODUCED TO SHOW FARMERS HOW TO REDUCE SOIL EROSION AND IMPROVE WATER QUALITY WHILE IMPROVING FARM MANAGEMENT, PRODUCTION, AND CONSERVATION PLANNING.

LAST YEAR, THE SECRETARY OF AGRICULTURE, MEMBERS OF TVA'S BOARD OF DIRECTORS, AND OTHER LEADERS FROM THE TENNESSEE VALLEY STATES MET IN MISSISSIPPI TO SIGN AN AGREEMENT KNOWN AS LAND AND WATER 201. TVA IS THE COORDINATOR FOR THIS MULTI-AGENCY EFFORT TO COMBAT SOIL EROSION THROUGHOUT THE SEVEN-STATE REGION.

ALTHOUGH IT IS IMPOSSIBLE TO LIST THE THOUSANDS OF PROJECTS WHICH TVA HAS PARTICIPATED IN OVER THE LAST FIVE DECADES, IT WILL SUFFICE TO SAY THAT TVA HAS MEANT PROGRESS FOR THE PEOPLE OF MISSISSIPPI, THE VALLEY REGION, AND THE NATION AS A WHOLE. ITS ACTIVITIES IN THE AREA OF AGRICULTURAL DEVELOPMENT PARTICULARLY HAVE CLEARLY DEMONSTRATED THE CONNECTION BETWEEN ITS REGIONAL DEVELOPMENT RESPONSIBILITIES AND ITS VALUE TO THE ENTIRE NATION.

MR. CHAIRMAN, I AM PLEASED TO HAVE HAD THIS OPPORTUNITY TO SPEAK ON BEHALF OF THE TENNESSEE VALLEY AUTHORITY AND THE EXCELLENT CONTRIBUTIONS IT HAS MADE TO THE STATE OF MISSISSIPPI.

STATEMENT OF JOHN J. DUNCAN
U.S. HOUSE OF REPRESENTATIVES
BEFORE THE SUBCOMMITTEE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

JULY 16, 1985

Mr. Chairman, I appreciate the opportunity to testify before this subcommittee. I want to congratulate you for your interest in the Tennessee Valley Authority and for your care in preparing for these oversight hearings, which I know are viewed by all of us as an opportunity for reviewing our unique Federal corporation in the Tennessee Valley.

As you may know, Mr. Chairman, in addition to my duties in the House of Representatives, I have been a businessman in Knoxville and I tend to look at most things as a businessman would. To me, the Tennessee Valley Authority is a business. I am also a lawyer and as I read the enabling act which our colleagues passed to create TVA 52 years ago, their intent is clear; TVA was meant to be operated as a business.

The questions we must ask have to do with the congressional charter for TVA and how well the agency has obeyed its congressional charge.

Briefly then, these were TVA's major responsibilities:

- o Improve the Tennessee River Valley through flood control;
- o Improve navigation along the Tennessee River;
- o Produce electric power at the "lowest feasible rates;"
- o Conserve and develop the region's bountiful natural resources;
- o Promote the economic and social well being of the people.

In each of these endeavors, TVA, by any standard or measure, has done well. Yesterday, you heard TVA's Board of Directors cite the agency's record during the past half century, and I will not take up this subcommittee's time by a repetition of these accomplishments.

Rather, I would prefer to challenge this subcommittee to consider the future of the Tennessee Valley. It is a future that is both hopeful and challenging.

Consider that there are more unemployed workers today in the TVA area than there were in 1979, before the severe national recession.

Many of the region's jobless are not just temporarily out of work. They are structurally unemployed. This means their old jobs are not coming back. Many are unable to find new work because they have been left behind by rapidly changing production processes brought on by improved technology or the relocation of industry out of the area.

It is not surprising, then, that Federal transfer payments—welfare, black lung disability, social security—have increased faster than any other single form of income in the Tennessee Valley. In all of Appalachia, which includes much of the Tennessee Valley, 7 of the 20 million people living there draw all or a portion of their support from some form of welfare and about 40 percent have incomes below the poverty level.

These are the problems that challenge us today and in the future.

But there is also a hopeful message that these problems can be and are being solved. In many instances, TVA plays a major role in coming up with a common sense solution as an essential part of the answer. Its integrated resource development and conservation effort heavily focuses on private enterprise. In developing and implementing its many programs, TVA also stresses self-reliance. In partnership with state, local, and private sector organizations, TVA works on a broad array of pressing economic and resource problems and often comes up with unique solutions.

For example, in the Copper Basin on the southeast Tennessee border where acid fumes from copper smelting early in this century wiped out 50 square miles of hardwood forest, TVA has come up with a sensible solution. Joining with a small local company, it has developed a proposal to use plant tissue-culture methods to produce large quantities of high-quality native plants that will demonstrate new reclamation techniques in the Copper Basin. Private funding from corporations with mining, papermaking, and lumber interests are being sought. If this venture is successful, it will have national significance by making techniques and superior plant stock available for reclamation of disturbed land throughout the Nation. Other positive results will follow: jobs, erosion control, improved forest quality.

TVA is looking forward in other ways as well. The Tennessee Technology Foundation, which seeks to create new high-tech businesses building on the technical expertise already available in the Knoxville-Oak Ridge area, has begun to put together a team well versed in

the technique of starting up new businesses and developing markets for them. Intent on drawing from the diversified engineering talents available at The University of Tennessee, the Department of Energy at Oak Ridge, and TVA, the foundation has hired a new president—straight out of TVA. TVA's loss is the foundation's gain, but it is not unusual for TVA to develop talented individuals who later move to the private sector.

In my own east Tennessee, we have had substantial problems with the north fork of the Holston River, where municipalities and industrial firms have invested heavily in waste treatment facilities. Despite this, portions of the river are still not clean enough to allow for industrial and urban growth. Working with EPA, Tennessee industrial dischargers, and the State, TVA is developing innovative methods combining a variety of techniques to produce water quality improvement at the least possible cost.

As in other areas, such as energy conservation, where TVA's home insulation program is a model for the nation's utility industry, TVA has become a yardstick by which success is often measured.

Its economic development programs, its integrated natural resource development and conservation efforts have, as I said at the beginning of my testimony, achieved significant improvement in the quality of life in the Tennessee Valley.

As this subcommittee reviews TVA's achievements and considers the future, I am confident that this corporation will figure prominently in the continuing Federal effort to help the people of the Tennessee Valley to help themselves.

Thank you, Mr. Chairman.

STATEMENT OF THE
HONORABLE CARROLL HUBBARD, JR.
FIRST DISTRICT, KENTUCKY

AN OVERSIGHT HEARING ON
THE TENNESSEE VALLEY AUTHORITY

TUESDAY, JULY 16, 1985

10:00 AM

COMMITTEE ON

THE ENVIRONMENT AND PUBLIC WORKS

U.S. SENATE

406 DIRKSEN SENATE OFFICE BUILDING

MR. CHAIRMAN, I AM PLEASED TO COME BEFORE THIS SUBCOMMITTEE TODAY TO UNDERScore HOW TVA CONTRIBUTES TO THE WELL-BEING OF PEOPLE NOT ONLY FROM MY WESTERN KENTUCKY DISTRICT BUT ALSO FROM ACROSS THE NATION--FROM NEW HAMPSHIRE TO CALIFORNIA.

AS NATIONAL LEGISLATORS, MR. CHAIRMAN, WE MUST ASSURE OURSELVES THAT THE FEDERAL ENTITIES WE HAVE CREATED AND MAINTAINED WITH TAXPAYER FUNDS PERFORM SOCIALLY AND ECONOMICALLY USEFUL FUNCTIONS FOR ALL AMERICANS.

WHEN WE SPEAK OF ECONOMIC AND SOCIAL BENEFITS FOR THE COUNTRY, CLEAN AIR MUST BE HIGH ON THE LIST OF PRIORITIES. AS YOU KNOW, TVA HAS VIGOROUSLY CONFRONTED THIS ISSUE BY EFFECTIVELY REDUCING SULFUR DIOXIDE EMISSIONS AT ALL ITS COAL PLANTS.

IN THE LATE 1970's TVA ALSO BEGAN DEVELOPING AN ADVANCED COAL BURNING PROCESS FOR THE NATION'S ELECTRIC UTILITY INDUSTRY. THIS PROCESS PERMITS THE BURNING OF HIGH SULFUR COAL IN AN ENVIRONMENTALLY ACCEPTED MANNER WITHOUT THE NEED FOR INSTALLING A DESULFURIZATION SYSTEM--SCRUBBERS--THAT REDUCES EFFICIENCY AND DRIVES UP COSTS. THE NEW SYSTEM IS KNOWN AS ATMOSPHERIC FLUIDIZED BED COMBUSTION, OR AFBC. TVA TOOK ITS INITIAL STEPS IN 1979 TO DEMONSTRATE THE FEASIBILITY OF THIS TECHNOLOGY TO THE NATION'S UTILITY INDUSTRY BY CONSTRUCTING A 20-M. AFBC PILOT PLANT ON THE TVA SHAWNEE STEAM PLANT SITE IN PADUCAH, KENTUCKY. THIS \$68 MILLION PLANT IS THE LARGEST AFBC UNIT TO OPERATE UNDER UTILITY CONDITIONS AND, SINCE ITS STARTUP IN 1982 IT HAS OPERATED OVER 11,000 HOURS AND CONSUMED ABOUT 60,000 TON OF HIGH-SULFUR KENTUCKY COAL.

BUILDING ON THE SUCCESS OF THIS AFBC PILOT FACILITY, TVA HAS TAKEN THE NEXT MAJOR STEP--THE CONSTRUCTION OF A UTILITY-SCALE DEMONSTRATION--AND IS IN THE PROCESS OF DESIGNING AND CONSTRUCTING AN AFBC REPLACEMENT UNIT FOR ONE OF ITS PULVERIZED COAL BOILERS AT THE SHAWNEE STEAM PLANT. THE UTILITY, RAILROAD, AND COAL INDUSTRIES HAVE RECOGNIZED THE IMPORTANCE OF THIS PROJECT AND HAVE MADE SUBSTANTIAL COMMITMENTS TO PAY A LARGE PORTION OF THE PROJECT'S COST. ONLY \$30 MILLION OF THE PROJECT'S ESTIMATED \$220 MILLION COST WILL BE PROVIDED BY APPROPRIATION.

THIS PROJECT, LIKE SO MANY TECHNICAL ADVANCES FOR WHICH TVA IS RESPONSIBLE, STEMS FROM A PRODUCTIVE PARTNERSHIP BETWEEN TVA, STATE LEADERS, AND THE PRIVATE SECTOR. CURRENT PARTICIPANTS INCLUDE THE COMMONWEALTH OF KENTUCKY, DUKE POWER COMPANY, COMBUSTION ENGINEERING, THE ELECTRIC POWER RESEARCH INSTITUTE, THE U.S. DEPARTMENT OF ENERGY, AND OTHERS IN THE UTILITY, TRANSPORTATION, AND ENERGY INDUSTRY. ALL OF THESE PARTICIPANTS CLEARLY SEE THIS EMERGING TECHNOLOGY AS A COST-EFFECTIVE INVESTMENT WITH IMMEDIATE COMMERCIAL APPLICATION THAT MAY MAKE IT POSSIBLE TO BURN HIGH-SULFUR EASTERN COAL IN AN ENVIRONMENTALLY ACCEPTED MANNER IN A NEW GENERATION OF COAL-FIRED GENERATING PLANTS.

IN ANOTHER PART OF THE DISTRICT, TVA IS USING ITS 170,000-ACRE LAND BETWEEN THE LAKES FACILITY TO DEVELOP RECREATION AND NATURAL-RESOURCE-RELATED ADVANCES OF BENEFIT TO THE NATION.

ONE OF THE MOST INTERESTING ACHIEVEMENTS AT LBL RESULTED FROM A STUDY OF TECHNIQUES TO CONCENTRATE FISH POPULATIONS IN SPECIFIC AREAS OF FRESH WATER LAKES AND RESERVOIRS. IN 1980, A STUDY RESULTING FROM THE NETWORK OF 17 STATE, FEDERAL AGENCIES, AND UNIVERSITIES FROM AROUND THE COUNTRY, WORKING AT CROOKED CREEK BAY

AT LAND BETWEEN THE LAKES, SHOWED THAT BRUSH AND OLD TIRES, LOCATED STRATEGICALLY, WERE EXTREMELY EFFECTIVE IN ATTRACTING FISH. BY 1984, 32 STATES WERE APPLYING THE LESSONS LEARNED AT LAND BETWEEN THE LAKES IN THEIR OWN FRESH WATER FACILITIES.

SINCE THE MID-1970s, LBL HAS BEEN INVOLVED WITH THE U.S. DEPARTMENT OF AGRICULTURE AND THE U.S. ARMY IN A NUMBER OF RESEARCH AND DEMONSTRATION PROJECTS TO CONTROL TICKS. AS YOU KNOW, TICKS ARE FAST BECOMING A MAJOR NUISANCE AND PUBLIC HEALTH PROBLEM. USING LBL AS A "LABORATORY," TVA WAS INSTRUMENTAL IN THE TESTING, REFINEMENT, AND EPA REGISTRATION OF A CHEMICAL KNOWN AS "DURBAN," AS A TICK CONTROL AGENT. THIS CHEMICAL IS NOW USED NATIONWIDE. TVA ALSO CONDUCTED THE INITIAL TESTING LEADING TO THE LICENSING IN 17 STATES OF THE INSECTICIDE NOW KNOWN AS "PERMANONE," AN EFFECTIVE TICK REPELLANT. FURTHER REFINEMENTS ON THE TICK CONTROL PROGRAM ARE BEING CONDUCTED BY TVA AND USDA IN A FOUR-YEAR PROJECT AT LBL. THE RESULTS COULD HAVE IMMEDIATE APPLICATION TO OUTDOOR AREAS THROUGHOUT THE COUNTRY.

WILDLIFE RESTORATION IS ANOTHER SUBJECT OF STUDY AT LBL. WORKING WITH OTHER FEDERAL AGENCIES, STATE ORGANIZATIONS, AND PRIVATE CONSERVATION GROUPS, TVA IS CONCENTRATING ON BRINGING BACK TO THE VALLEY BALD EAGLES AND OSPREY WHO ONCE LIVED THERE IN GREAT NUMBERS. THE PROJECT WAS STARTED WHEN 16 EAGLES AND 11 OSPREY WERE RAISED AND RELEASED AT LBL--A TECHNIQUE KNOWN AS "HACKING"--IN THE HOPE THAT THEY WILL RETURN TO THE REGION WHEN MATURE AND RAISE THEIR OWN YOUNG. AN EAGLE RELEASED FROM LBL IN 1981 RETURNED THERE WITH A MATE IN 1984 AND 1985 AND IN EACH YEAR RAISED ONE YOUNG. THIS IS THE FIRST PRODUCTIVE EAGLE NEST AT LBL IN 30 YEARS. SEVERAL OTHER STATES' WILDLIFE AGENCIES HAVE VISITED LBL AND MODELED THEIR

"HACKING" PROGRAMS AFTER THE TVA EXPERIMENT.

MR. CHAIRMAN, THESE ARE BUT A FEW EXAMPLES OF HOW TVA'S TECHNICAL EXPERTISE IS BEING APPLIED IN CREATIVE AND INNOVATIVE WAYS TO PROBLEMS THAT ARE NATIONAL IN SCOPE. THEY DEMONSTRATE TO ME THAT TVA IS MAKING GREAT STRIDES IN DIVERSE FIELDS WHICH BENEFIT ALL PARTS OF THE COUNTRY.

IN THE FIELD OF ECONOMIC AND COMMUNITY DEVELOPMENT, TVA IS PROVIDING MUCH-NEEDED TECHNICAL ASSISTANCE TO AREAS THAT WANT TO HELP THEMSELVES. THESE CAREFULLY FOCUSED PROGRAMS ARE SUCCESSFUL BECAUSE THEY REFLECT LOCAL NEEDS AND DESIRES AND ARE IMPORTANT BECAUSE TVA SERVES AS A CATALYST FOR FORCES FOR CHANGE WITHIN THE COMMUNITY. SUCH PROGRAMS CONTINUE TO BE NEEDED BECAUSE THE VALLEY REGION STILL LAGS BEHIND THE NATION IN CERTAIN CRUCIAL RESPECTS. THE PER CAPITA INCOME IN THE TENNESSEE VALLEY IS LESS THAN 80 PERCENT OF THE NATIONAL AVERAGE. MANY OF OUR CITIES AND TOWNS LACK THE TAX BASE TO PROVIDE THEIR CHILDREN WITH A FIRST-CLASS EDUCATION. FOR THE SAME REASON, OTHER PUBLIC SERVICES, SUCH AS WASTE TREATMENT, WATER SUPPLY, AND EVEN ROADS ARE INADEQUATE. IN OTHER WORDS, IN MANY PARTS OF THE TENNESSEE VALLEY, THE INFRASTRUCTURE WHICH THE BUSINESSES THAT MIGHT EXPAND MUST COUNT UPON--IS NOT ALWAYS READILY AVAILABLE.

TVA HAS MADE GREAT STRIDES TO IMPROVE THIS SITUATION THROUGH ITS TECHNICAL ASSISTANCE TO MANY COMMUNITIES SEEKING TO IMPROVE THAT INFRASTRUCTURE. THE GAINS ARE STEADY. IF TVA WERE NOT IN THE FIELD, HELPING AS IT DOES, I KNOW OUR CIRCUMSTANCES WOULD BE EVEN MORE DIFFICULT. WE MUST NOT LET THIS HAPPEN.

I WOULD BE REMISS IF I FAILED TO MENTION SEVERAL PROJECTS LISTED IN THE U.S. ARMY CORPS OF ENGINEERS' CIVIL WORKS BUDGET REQUEST FOR FY 1986, AS FOLLOWS:

-- \$1,200,000 UNDER THE DAM SAFETY ASSURANCE PROGRAM FOR CONSTRUCTION ON BARKLEY DAM ON LAKE BARKLEY, KENTUCKY, TO PREVENT THE FAILURE OF THE DAM DURING AN EARTHQUAKE. BARKLEY DAM IS 70 MILES FROM THE EPICENTER OF THE NEW MADRID FAULT LINE AND IN THE EVENT OF AN EARTHQUAKE, LIQUEFACTION OF THE DAM'S FOUNDATION WOULD OCCUR AFFECTING THE SAFETY OF THE STRUCTURE.

-- \$4,427,000 FOR OPERATION AND MAINTENANCE OF BARKLEY DAM ON LAKE BARKLEY, KY.

-- \$800,000 FOR A STUDY OF THE NAVIGATIONAL PROBLEMS AND HYDROPOWER POTENTIAL OF THE CUMBERLAND AND TENNESSEE RIVERS, ESPECIALLY ON THE CUMBERLAND RIVER BELOW BARKLEY DAM WHERE THE CHANNEL IS NOT WIDE ENOUGH IN SOME PLACES FOR EASY AND SAFE TOWING.

-- \$935,000 TO CONTINUE THE MAJOR REHABILITATION OF LOCKS AND DAM 53, KY AND ILLINOIS. THE FUNDS PROVIDE FOR THE CONTINUATION OF MAJOR REPAIRS OF THE EXISTING STRUCTURE WITH THE ANTICIPATED COMPLETION DATE STILL SET FOR JUNE, 1986.

-- \$1,200,000 FOR A CONTINUED PLANNING IN ENGINEERING STUDY

AS THE SUBCOMMITTEE CONTINUES ITS REVIEW, I HOPE IT WILL KEEP IN MIND THE WIDE VARIETY OF BENEFITS TVA HAS YIELDED FOR OUR NATION. TVA DESERVES THE CONTINUING SUPPORT OF THIS SUBCOMMITTEE AND THE UNITED STATES CONGRESS. THANK YOU.

STATEMENT OF SENATOR JEREMIAH DENTON
SENATE ENVIRONMENT AND PUBLIC WORKS SUBCOMMITTEE
ON REGIONAL AND COMMUNITY DEVELOPMENT
JULY 16, 1985

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE, I APPRECIATE THE OPPORTUNITY TO JOIN MY COLLEAGUES FROM THE TENNESSEE VALLEY CONGRESSIONAL DELEGATION TO TESTIFY TODAY. I WANT TO COMMEND THE CHAIRMAN FOR HOLDING THIS HEARING. THE CONGRESS HAS THE AUTHORITY AND THE RESPONSIBILITY TO MEET ITS OBLIGATIONS TO OVERSEE THE PROGRAMS OF THE TENNESSEE VALLEY AUTHORITY.

I WANT TO MAKE SEVERAL POINTS ABOUT TVA'S APPROPRIATED BUDGET:

- 1) IN LIGHT OF THE CURRENT BUDGET SITUATION, TVA'S APPROPRIATED BUDGET WILL HAVE TO BE REDUCED.
- 2) THE PROPOSED 70% REDUCTION IS FAR TOO DRASTIC.
- 3) WE MUST CAREFULLY REVIEW THE PROGRAMS UNDER TVA'S APPROPRIATED BUDGET.

4) WE MUST CONSIDER THAT SOME OF TVA'S PROGRAMS
HAVE NATIONAL AS WELL AS REGIONAL SIGNIFICANCE.

5) THE TVA REGION, AND PARTICULARLY NORTHERN
ALABAMA, STILL LAG ECONOMICALLY BEHIND MOST
SECTIONS OF THE NATION.

I AM HERE ON BEHALF OF MY CONSTITUENTS IN NORTHERN
ALABAMA TO EXPRESS THEIR CONCERN THAT THE PROPOSED SEVENTY
PERCENT REDUCTION IN TVA'S APPROPRIATED BUDGET SHOULD BE
CAREFULLY REVIEWED BEFORE THE CONGRESS TAKES ANY FINAL
ACTION. I FULLY REALIZE THAT A SUBSTANTIAL REDUCTION IN THE
FEDERAL DEFICIT IS A TOP PRIORITY OF THE CONGRESS. DURING
CONSIDERATION OF THE SENATE BUDGET RESOLUTION, I FULLY
SUPPORTED THE PRESIDENT BY OPPOSING AMENDMENTS TO INCREASE
FEDERAL SPENDING. OF COURSE, THE BUDGET PROBLEM HAS A MAJOR
EFFECT ON HOW THE CONGRESS MUST ADDRESS TVA'S APPROPRIATED
BUDGET.

MY CONCERN ABOUT THE PROPOSED SEVENTY PERCENT REDUCTION
OF TVA'S APPROPRIATED BUDGET IS THAT TAKING THE MEAT AXE
APPROACH IS NOT THE BEST APPROACH FOR THE CONGRESS TO
IMPLEMENT. I WOULD RECOMMEND MORE OF A SCALPEL APPROACH. I
BELIEVE, HOWEVER, THAT TVA MUST TIGHTEN ITS BELT AND

CONTRIBUTE TOWARDS REDUCING THE NATIONAL DEFICIT. IN OTHER WORDS, TVA MUST PAY ITS "FAIR SHARE". THE QUESTION IS, "WHAT IS A FAIR SHARE?" I DO NOT PRETEND TO KNOW WHAT THE PERCENTAGE REDUCTION SHOULD BE. I ENCOURAGE YOU, HOWEVER, CAREFULLY TO REVIEW THE DIFFERENT PROGRAMS UNDER TVA'S APPROPRIATED BUDGET AND JUDGE THEM ON THEIR OWN MERITS.

A SEVENTY PERCENT REDUCTION IN TVA'S APPROPRIATED BUDGET WOULD HAVE A DEVASTATING EFFECT ON THE ECONOMY OF NORTHERN ALABAMA. AS YOU KNOW, ALABAMA CONTINUES TO HAVE THE THIRD HIGHEST UNEMPLOYMENT RATE IN THE NATION. THE UNEMPLOYMENT RATE FOR ALABAMA IN MAY (LAST FIGURES AVAILABLE) WAS 8.7%. IN NORTHERN ALABAMA, THE UNEMPLOYMENT RATE IN THE SHOALS AREA (NORTHWEST) IS APPROXIMATELY 15%; IN JACKSON COUNTY (NORTHEAST), IT IS APPROXIMATELY 12% AND INCREASING. A STUDY DONE EARLIER THIS YEAR BY NORTH ALABAMA UNIVERSITY STATED THAT CLOSING THE NATIONAL FERTILIZER DEVELOPMENT CENTER WOULD INCREASE UNEMPLOYMENT IN THE SHOALS AREA FROM 15% TO 25%.

UNDER THE PROPOSED SEVENTY PERCENT REDUCTION, THE WATER RESOURCES, LAND (FOREST RESOURCES), LAND BETWEEN THE LAKES, ECONOMIC RESOURCES, COMMUNITY RESOURCES, AGRICULTURAL RESOURCES DEVELOPMENT, RECREATIONAL FACILITIES AND CHEMICAL FACILITIES PROGRAMS WOULD BE ZERO FUNDED. IN ADDITION,

FUNDS FOR THE NATIONAL FERTILIZER DEVELOPMENT CENTER WOULD BE REDUCED FROM \$36 MILLION TO \$10 MILLION.

I KNOW THAT A QUESTION ON THE CHAIRMAN'S MIND IS WHETHER IT IS NECESSARY FOR TVA TO CONTINUE THOSE PROGRAMS. I BELIEVE THAT, WHERE POSSIBLE, THE PRIVATE SECTOR SHOULD ASSUME THE RESPONSIBILITY OF MEETING THE GOAL OF FURTHERING ECONOMIC DEVELOPMENT IN THE TVA REGION. I MUST POINT OUT, HOWEVER, THAT SOME OF TVA'S PROGRAMS NOT ONLY BENEFIT THE REGION BUT ALSO HAVE NATIONAL SIGNIFICANCE. THE NATIONAL FERTILIZER DEVELOPMENT CENTER AND THE TVA SOIL CONSERVATION PROGRAM, RUN IN CONJUNCTION WITH THE DEPARTMENT OF AGRICULTURE, ARE TWO EXAMPLES OF PROGRAMS THAT BENEFIT THE ENTIRE NATION.

I STRONGLY OPPOSE TAKING ACTION THAT WOULD RESULT IN THE SHUTDOWN OF THE NATIONAL FERTILIZER DEVELOPMENT CENTER. I AM SURE THAT YOU WILL BE PLEASED TO KNOW THAT TVA IS WORKING WITH THE PRIVATE SECTOR AND THE ADMINISTRATION TO PHASE-OUT FEDERAL FUNDING TO THE NFDC. I SUPPORT THAT EFFORT, AND I WILL CONTINUE TO WORK TOWARDS A MUTUALLY SATISFACTORY TIMETABLE TO MEET THE GOAL. THE NFDC IS THE ONLY NATIONAL FERTILIZER RESEARCH CENTER IN THE NATION. THE AGRICULTURAL COMMUNITY AROUND THE WORLD HAS BENEFITED FROM ITS WORK. WE SHOULD CONTINUE ITS OPERATION FOR THE BENEFIT

OF AGRICULTURE AND CONSUMERS, AND TO PROTECT THE JOBS IN THE SHOALS AREA. AT THE SAME TIME, WE SHOULD REDUCE THE FEDERAL OBLIGATION.

ONE OF TVA'S GOALS UNDER THE TVA ACT IS TO PROMOTE ECONOMIC AND COMMUNITY DEVELOPMENT. AS I PREVIOUSLY STATED, THOSE PROGRAMS WOULD BE ZERO FUNDED. OVER THE YEARS, TVA HAS PROVIDED TECHNICAL ASSISTANCE TO LOCALITIES AND THE PRIVATE SECTOR TO CREATE JOB OPPORTUNITIES, EXPAND INDUSTRY, AND PROMOTE THE GENERAL WELFARE OF THE PUBLIC. I HAVE HEARD FROM MANY MAYORS AND CITY COUNCILS IN NORTHERN ALABAMA WHO BELIEVE THAT TVA'S ASSISTANCE IS JUST AS NECESSARY TODAY AS IT HAS BEEN IN THE PAST.

MR. CHAIRMAN, THE TENNESSEE VALLEY REGION STILL LAGS BEHIND THE REST OF THE NATION IN ECONOMIC GROWTH. I BELIEVE THAT REDUCING THE FEDERAL DEFICIT WILL HELP REDUCE INTEREST RATES AND PROMOTE ECONOMIC GROWTH IN THE REGION. I REQUEST, HOWEVER, THAT YOU CAREFULLY CONSIDER THE ECONOMIC EFFECT ON THE REGION AND THE NATION OF ELIMINATING MOST OF TVA'S APPROPRIATED NON-POWER PROGRAMS. I BELIEVE THAT A BETTER PLANNED AND GRADUAL APPROACH WOULD BETTER SERVE OUR NATION AND THE PEOPLE OF THE TENNESSEE VALLEY WHILE STILL CONTRIBUTING TOWARDS REDUCING THE FEDERAL DEFICIT.

SUCH A CONSIDERED APPROACH WOULD ALSO PROVIDE TVA AND THE CONGRESS TIME TO DETERMINE IF AND HOW THE PRIVATE SECTOR CAN PLAY A GREATER ROLE AND SHARE MORE IN IMPLEMENTING SOME OF THESE PROGRAMS.

TO CHANGE THE SUBJECT FROM THE APPROPRIATED BUDGET, I MUST EXPRESS MY CONCERN ABOUT TVA'S DECISION AGAIN TO SLOW DOWN CONSTRUCTION OF THE BELLEFONTE NUCLEAR PLANT IN SCOTTSBORO, ALABAMA. BASED ON ITS RECENT LOAD FORECAST, TVA HAS CONCLUDED THAT THE BELLEFONTE PLANT WILL NOT BE NEEDED UNTIL 1993. THE DECISION WILL HAVE A MAJOR NEGATIVE EFFECT ON THE ECONOMY OF JACKSON COUNTY AND SURROUNDING AREAS. AS MANY AS 1980 EMPLOYEES WILL BE AFFECTED BY THE DECISION.

I DO NOT BELIEVE THAT PROJECTS SHOULD BE COMPLETED IF THEY ARE NOT JUSTIFIED BY NEED AND ECONOMICS. THE DECISION DOES, HOWEVER, RAISE QUESTIONS ABOUT THE RELIABILITY OF TVA'S LOAD FORECASTS FOR THE EFFICIENT PLANNING OF FUTURE ENERGY AND ECONOMIC NEEDS IN THE TVA REGION. IT ALSO RAISES MAJOR QUESTIONS ABOUT THE MANAGEMENT OF TVA'S NUCLEAR PROGRAM.

TVA'S POWER PROGRAMS HAVE A MAJOR EFFECT ON THE LIVES OF MY CONSTITUENTS IN NORTHERN ALABAMA, AND TVA THUS HAS A MAJOR RESPONSIBILITY TO ENSURE THAT ITS ACTIVITIES RESPOND

EFFECTIVELY TO THEIR NEEDS. THAT MATTER, ALONG WITH OTHER ISSUES CONCERNING TVA'S NUCLEAR PROGRAM, SHOULD BE ADDRESSED IN A CONSTRUCTIVE MANNER. TVA HAS RECENTLY TAKEN ACTION TO REORGANIZE THE MANAGEMENT OF ITS NUCLEAR PROGRAM. I COMMEND THE BOARD FOR TAKING THIS ACTION, ALTHOUGH IT SHOULD HAVE BEEN TAKEN LONG BEFORE NOW.

I HAVE WRITTEN A LETTER TO THE BOARD EXPRESSING MY CONCERN AND ASKING THAT IT PROMPTLY RESPOND TO A NUMBER OF QUESTIONS THAT I HAVE ABOUT THE BELLEFONTE DECISION AND THE NUCLEAR PROGRAM IN GENERAL.

THANK YOU, MR. CHAIRMAN.

United States Senate

WASHINGTON, D.C. 20510

July 15, 1985

Mr. Charles H. Dean, Jr.
Chairman
Tennessee Valley Authority
El2A7 Summitt Hill Drive
Knoxville, Tennessee 37902

Dear Chairman Dean:

I am concerned about TVA's recent decision to delay construction of the Bellefonte nuclear facility in Scottsboro, Alabama. A member of my staff has already brought my interest in the matter to the attention of your Washington staff. As a result, you sent me a letter, dated July 11, 1985, and attached an explanation of the decision.

I understand that the decision was based on new load forecasts through the year 2005. I do not believe that projects should be completed if they are not justified by need and economics. In fact, I have not always opposed TVA's decision to cancel projects that do not meet the criteria of need and cost.

I am concerned, however, that the Bellefonte decision will have a devastating affect on the economy of Jackson County and surrounding areas. It also raises questions about the reliability of your load forecasts for the efficient planning of future energy and economic needs in the Tennessee valley. TVA's activities have a major effect on the lives of my constituents in northern Alabama, and TVA thus has a major responsibility to ensure that its activities respond effectively to their needs.

The problem that TVA currently faces with its overall nuclear program must be carefully reviewed by the members of the Congressional delegation from TVA's service area. I know that you are making an effort to reorganize the nuclear program, and I commend you for it.

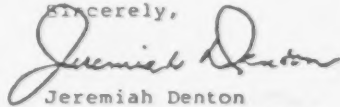
You must admit, however, that the TVA nuclear program has had major problems for several years. The almost one million dollars that TVA has had to pay to the Nuclear Regulatory Commission since 1980 for safety violations come out of the pockets of the ratepayer. TVA has the responsibility to ensure that its programs run in a way that

does not expose it, and its ratepayers, to costs of that sort. Similarly, the ratepayers bear the major burden of substantial investment in nuclear projects that have been cancelled before completion.

The problems that have existed in TVA's nuclear program lead me to believe that this may be a good time to review the structure and functions of the TVA Board of Directors. My constituents have expressed their frustration that they and their representatives have no power directly to influence the decisions of the Board. They are also concerned that Alabama is not represented on the Board. As you know, last year I attempted unsuccessfully to have an Alabamian appointed to the Board.

I enclose several questions to which I urge you to respond promptly.

Sincerely,



Jeremiah Denton
United States Senator

JD:nc
Enclosure

TENNESSEE VALLEY AUTHORITY
KNOXVILLE TENNESSEE 37902

OFFICE OF THE BOARD OF DIRECTORS

AUG 5 1985

The Honorable Jeremiah Denton
United States Senate
Washington, D.C. 20510

Dear Senator Denton:

This is in response to your July 15 letter. We appreciate the interest you have shown in TVA's recent decision to slow construction of the Bellefonte Nuclear Plant. While this decision does have unfortunate implications for some of TVA's employees, it was a necessary step to protect the interests of the TVA ratepayers. In order to run the system in the most cost-effective manner, consistent with the TVA Act, hard decisions sometimes must be made.

The economy has significantly affected power sales, both in the short term because of the recession and from a longer perspective due to apparent permanent changes in the level and pattern of electric use. TVA's load forecasting process is designed to evaluate these considerations in a timely manner, resulting in an annual load forecast review. The most recent load forecast showed changes over previous estimates due to economic considerations that have recently matured. Previously it appeared that Bellefonte would be needed earlier than current estimates. In October 1984, based on these previous forecasts, TVA management reinforced the view that Bellefonte be completed as early as possible and complimented Bellefonte employees on their work progress. Based on new load forecast information, coupled with trends that suggest early completion of the unit would not produce a saving in the cost of producing electricity, the schedule for the completion of Bellefonte has been delayed. It should be emphasized that the plant is still under construction. It is not deferred but merely slowed down to better match projected system needs.

The recent revision to the construction schedule still permits TVA to meet its responsibilities in the coming years to have an ample supply of electricity. TVA based this change on two factors, the first being that Bellefonte, if completed on the earlier schedule, probably would not present a cost saving over operation of TVA's existing coal-fired capacity. The second factor was new long-term load forecasts which demonstrated that new capacity would not be needed until the mid-1990s. Given that TVA will have ample capacity to support high economic growth in the TVA region without immediate completion of Bellefonte, we chose a course of action that should cost the TVA ratepayer the least while at the same time increasing system flexibility. The white paper on the revision to the Bellefonte construction schedule, which we previously provided (July 11), explains the reasons for the change in more detail.

Enclosed are our responses to the 11 questions you asked about TVA's recent decisions. We would be pleased to answer any additional questions you may have.

We are keenly aware that our decisions about and management of TVA's nuclear program affect both TVA ratepayers and employees and can affect the economy of a particular portion of the TVA service area differently than the region as a whole. We want to assure you that it is our intent to efficiently but safely manage the TVA system to minimize adverse impacts on both groups and economies. We recognize, too, our limitations and our need for assistance from the members of the congressional delegation from the TVA region. Every person at TVA appreciates your continued support for our efforts to improve our nuclear program. It is only through such cooperation that the benefits of TVA, both from its appropriated and power programs, can be fully realized, at a cost that burdens neither the citizens of this Nation nor the ratepayers in the TVA service area.

Sincerely,



C. H. Dean, Jr.
Chairman

Enclosure

QUESTIONS AND RESPONSES

Question 1. What is the current completion percentage of the Bellefonte nuclear plant?

TVA Response: Based on our previous commercial operation dates of January 1989 and April 1992 for units 1 and 2, respectively, the percent complete--as of June 27, 1985--was 73.6 percent overall, 83.8 percent for unit 1, 54.0 percent for unit 2, and 24.0 percent for operationally independent work. The percentages shown are based on trades and labor man-hours.

The revised schedule calls for commercial operation dates of October 1993 and October 1995. This extended schedule will require additional man-hours for maintenance and other fixed overhead activities. When these man-hours are added, the percent complete will be somewhat less than previously calculated.

Question 2. What is the current completion percentage of the Watts Bar II nuclear plant?

TVA Response: As of June 30, 1985, Watts Bar unit 2 was 80.1 percent complete based on trades and labor man-hours.

Question 3. How much money has been spent to date on the construction of the Bellefonte facility?

TVA Response: Through June 30, 1985, total actual expenditures were \$2.233 billion excluding interest and \$3.301 billion including interest.

Question 4. How much of a savings do you expect that TVA ratepayers will receive from the decision to delay construction of Bellefonte?

TVA Response: The delay in the construction of Bellefonte is expected to be beneficial to TVA ratepayers in several ways. First, the delay will help in minimizing rate increases over the next few years. Expenditures at the plant will go from an original estimate of \$240 million in 1986 to \$110 million, which impacts rates by the amount of interest on borrowed funds.

Second, the delay will provide flexibility to better match the supply of capacity with the requirements for capacity. There is no incentive to bring the units online early based on national industry and TVA trends which indicate total operating costs for nuclear generation will be slightly higher than costs for coal-fired generation. (The operating cost issue is addressed further in question 10.)

There has thus been a significant erosion of the prospective operating saving associated with nuclear plants.

Nuclear fuel cost is about half of the fuel cost of coal-fired plants. However, the operation and maintenance (O&M) costs at nuclear plants are three to four times those associated with a coal-fired plant. Together, total

operating costs for nuclear generation have reached the level of coal-fired generation. Based on this recent trend, indications are that nuclear O&M costs will continue to escalate at a rate faster than the operating costs for coal-fired generation.

Fuel prices for both coal and nuclear are projected to escalate approximately the same so that the total operating costs for nuclear will continue to be higher than for coal-fired generation. TVA is working to minimize nuclear operating costs, but it is highly uncertain as to the degree to which these nuclear expenses can be reduced. Thus, the operational cost savings once associated with the nuclear plants are no longer likely.

Question 5. I have been told that, last year, a member of the Board met with the employees at the Bellefonte plant and told them that TVA planned to complete construction of the plant on schedule. Based on that, many of the employees made major decisions relating to their personal lives. I know that economic conditions change but TVA must realize the effect of its comments and decisions on the lives of the employees. Please comment.

TVA Response: On October 12, 1984, Director Richard M. Freeman and H. G. Parris, Manager of Power and Engineering, addressed Bellefonte Nuclear Plant employees at the plant. Enclosed is the text of their remarks.

At the time these comments were made, the projected need dates for the Bellefonte units were earlier than with the latest forecast estimates. Also, the increasing trend toward nuclear operating costs exceeding coal-fired operating costs has suggested it is prudent to bring capacity online as required to match power supply needs.

The remarks made by Mr. Freeman and Mr. Parris reflected honest appreciation for a job well done. Mr. Parris did state, however, that he could not "categorically state that there is no chance that Bellefonte would ever be deferred." To date, Bellefonte has been slowed in construction, not deferred; and based on current information, it is in the best interest of the ratepayer to maintain flexibility to complete the plant as required.

TVA is attempting to locate other jobs within TVA for as many employees as possible.

Question 6. Load forecasts are of course necessary to plan for the future, but how accurate have they been during the last twenty years?

TVA Response: The enclosed graph shows the accuracy of TVA's load forecasts since 1965. For purposes of brevity, only selected forecasts are shown rather than all twenty. Actual load has been below forecast load because of unforeseen events relating to energy costs, interest rates, and economic activity. Subsequent to the OPEC oil embargo, energy costs increased significantly, resulting in huge increases in coal costs. These higher coal costs resulted in higher electricity prices. Also, in the mid-1970s and early 1980s, interest rates were much higher than historical experience

which resulted in higher than expected construction costs and electricity prices. Regarding economic activity, the 1982 recession was unforeseen as late as mid-1981. All of these factors had a suppressing effect on load growth, not only for TVA but on a national basis.

In recent years, TVA has used a range (high, medium, and low) of load forecasts in an attempt to account for the uncertainties inherent in load growth. For this reason, the high and low forecasts are shown for the 1983 and 1986 forecasts. The high forecast has a 90-percent probability that actual load will be less than forecast load and the low forecast has a 10-percent probability that actual load will be less than forecast load. TVA plans the power system on the basis of the high forecast to ensure for the provision of adequate power to meet a high rate of economic growth.

Question 7. Your July 11 letter to me states that there is a pending reduction of 1,980 employees at the Bellefonte facility. I had understood that 1,805 employees would be affected. Please explain.

TVA Response: On large construction projects, employment levels can fluctuate substantially in a relatively short time. The following table reflects present and proposed employment levels of the three major Power and Engineering offices.

	<u>Present</u>	<u>Proposed</u>	<u>Change</u>
Office of Construction (as of 6-30-85)	2475	900	-1575
**Office of Engineering (as of 7-2-85)	656*	250	- 406*
Office of Nuclear Power (as of 6-30-85)	<u>337</u>	<u>175</u>	<u>- 162</u>
Total	3468	1325	-2143*

*Includes 171 contract personnel.

**Only 68 of these employees were located at the Bellefonte facility.

Question 8. What percentage of the employees at Bellefonte live in Jackson County? What percentage live in other Alabama counties? What percentage are not Alabama residents?

TVA Response: As of July 31, 1984, the following percentages were derived from a survey of employees located at the plant site:

Employees living in Jackson County, Alabama.....	50 percent
Employees living in other Alabama counties.....	33 percent
Employees living in Tennessee.....	15 percent
Employees living in Georgia.....	<u>2 percent</u>
	100 percent

Question 9. You give, as a major reason for the lower range forecasts, the decrease in service to major industrial customers such as primary aluminum and

ferroalloys. You go on to state that because of foreign competition and lower product demand those industries are not economically expanding. I believe that everyone would agree with these points. You do not, however, make any mention of the effect that TVA industrial rates have had on this situation. I have heard from many industrial ratepayers in the TVA region about the effect that TVA rates have had on their competitive posture. Although the most recent chart shows that TVA industrial rates are lower than those of many private utilities in the southeast, I believe that TVA's rates have had a detrimental effect on industrial growth in the region.

TVA Response: From 1970 to 1984 manufacturing output in real terms (adjusted for inflationary impacts) grew at 3.9 percent per year in the TVA region and 3.0 percent per year in the U.S. Over this same period of time, electricity sales to distributor-served industries in the TVA region grew at the rate of 2.7 percent per year. These growth rates indicate fairly good economic performance for the entire manufacturing sector of the TVA region.

It is true that certain electricity-intensive directly served industries are experiencing difficulties. However, these difficulties are occurring on a nationwide basis and are not particular to the industries in the TVA region. Aluminum and ferroalloy plants throughout the U.S. are operating at significantly reduced levels and in some cases are indefinitely or permanently closed. Regarding electricity-intensive industries, rates must be competitive on a worldwide basis. This is difficult considering the extremely cheap hydroelectric power (1.0 to 1.2 cents per kWh) which is readily available in Canada. Also, some foreign countries subsidize production in electricity-intensive industries such as primary metals. In some cases, these subsidies are in the form of electricity prices which are lower than the costs of electricity production. In one case, the cost of electricity to an aluminum producer fluctuates with the price of aluminum ingot. Regardless of the form of the subsidy, either directly or indirectly through low electricity prices, world prices of the commodity will be lower and U.S. producers who must compete without any subsidies will be adversely impacted.

TVA is very much aware of the situation with electricity-intensive industries and is attempting to assist these industries as much as possible. For example, TVA's limited interruptible power (LIP) rate provides a 25-percent discount from approximately 3.7 cents per kWh under firm power rates to 2.7 cents per kWh under LIP rates. To date, 19 industrial customers have contracted for a total of 631 megawatts of LIP. Of course, the LIP rates are designed to meet the necessary criteria of benefiting the LIP customers without imposing additional costs on other customers.

Question 10. You state that the operation and maintenance costs at nuclear plants are three to four times those associated with a coal fired plant. Is that true for nuclear plants in general or just for those in the TVA system? How much of the cost is due to management problems at TVA?

TVA Response: O&M costs for nuclear plants across the industry appear to be three to four times that of coal-fired plants based on statistics reported to

the Federal Energy Regulatory Commission. For all operating U.S. nuclear plants, TVA's Browns Ferry and Sequoyah Nuclear Plants O&M costs in mills per kilowatthour in recent years have been about 70 percent of the industry average. Similar data for utilities with coal-fired units indicate that TVA's coal-fired plant O&M costs are about the same as the industry average.

On a total operating cost basis, there is little difference, if any, between the coal-fired and nuclear options because of the fuel savings associated with the nuclear plants.

Question 11: You recognize that there is much uncertainty in the outlook for future load growth. If the economy in the TVA region begins to grow faster than you have predicted, will you have sufficient time to get Bellefonte on line to meet demand? Are there other prospective sources of power to meet that demand?

TVA Response: TVA plans its power supply to ensure adequate capacity to meet the high load growth requirement, which has a low probability of occurrence. Rapid load growth beyond that projected is, however, always possible.

One of the key aspects of planning an adequate power supply is to maintain flexibility to match supply with requirements. TVA has identified a number of power supply options that can be implemented on a fairly short "leadtime," including the completion of Bellefonte. Other options include:

Increased program activity for conservation and load management.

Program to improve the reliability and operation of existing large coal and nuclear plants.

Purchase agreements with other utilities and combustion turbine capacity.

Longer leadtime options include conventional coal-fired generating capacity, Atmospheric Fluidized Bed Combustion coal-fired capacity, and new technologies such as Advanced Nuclear Reactors.

Load projections are made annually, at which time power supply projections are reviewed to determine the ability of the system to meet the high load projections. If projections for the need for Bellefonte indicate earlier completion than the mid-1990s, the project could be completed earlier. Any of these supply options could be initiated as necessary to ensure an ample supply of electricity to meet high load projections. At the same time, it would be more costly to ratepayers to pursue these options prior to the time they are required.

REMARKS BY RICHARD M. FREEMAN, DIRECTOR
TENNESSEE VALLEY AUTHORITY
BEFORE THE BELLEFONTE EMPLOYEES MEETING
OCTOBER 12, 1984 BELLEFONTE NUCLEAR PLANT

I'm here to congratulate all of you on achieving your construction milestones for FY 1984. Of the 12 major milestones, 5 were completed on schedule and 7 were completed ahead of schedule. In fact, three of the milestones were met a month ahead of schedule and one was finished two months ahead of schedule.

October, as some of you know, is National Quality month. It's most encouraging to hear that actions taken here at Bellefonte are slowing the number of inspection rejection notices and that redundant work to correct problems is decreasing in all areas. That is what productivity is all about. And, in an industry which has taken its licks in recent years over quality control, you are making an important contribution to the continued viability of nuclear power for the future.

I'm particularly proud of the fact that your safety record is among the best in TVA. Hugh tells me you've been the flagship of the Construction Safety Program for

the past two years. A productive work environment means nothing if it's not a safe work environment. I can tell you that TVA, from the Board down, is vitally concerned with worker safety. I salute you for making this construction site a safe place to work.

Finally, I want to reaffirm what Hugh has said about the need for Bellefonte. There is understandable concern these days over the future of any nuclear construction program in the country. I want to emphasize that there are currently no plans to alter the construction schedule for Bellefonte in the near or long term. In fact, I think that employees here have every reason to be optimistic. You are meeting your goals and setting an excellent example for the rest of the TVA organization. Best of luck to all of you.

REMARKS TO BELLEFONTE EMPLOYEES
BY H. G. PARRIS
MANAGER OF POWER AND ENGINEERING
TENNESSEE VALLEY AUTHORITY
BELLEFONTE NUCLEAR PLANT
OCTOBER 12, 1984

A YEAR AGO AT THE BELLEFONTE NMA MEETING IN SCOTTSBORO, I SPOKE TO A GROUP OF BELLEFONTE MANAGERS ABOUT THE STATUS AND FUTURE OF THIS POWER PLANT. I SAID AT THE TIME THAT THERE WAS A PERCEPTION THAT WE NEEDED A TURNAROUND AT BELLEFONTE SIMILAR TO THE TURNAROUND THAT WAS TAKING PLACE THROUGHOUT THE OFFICE OF POWER AND THE REST OF TVA IN RESPONSE TO CHANGING ECONOMIC CONDITIONS.

I THINK IT'S A TRIBUTE TO ALL OF YOU FOLKS HERE AT BELLEFONTE THAT THAT PERCEPTION NO LONGER EXISTS. I'M HERE TODAY TO CONGRATULATE YOU FOR YOUR EFFORTS IN A NEW DIRECTION.

THE FIGURES I'M SEEING LATELY ARE REALLY ENCOURAGING. MILESTONES ARE BEING ACCOMPLISHED ON OR AHEAD OF SCHEDULE, PRODUCTIVITY REMAINS ABOVE THE NATIONAL AVERAGE FOR A PROJECT AT THIS STAGE OF COMPLETION, AND THE QUALITY OF WORK HAS INCREASED SUBSTANTIALLY, BASED ON THE DECLINING NUMBER OF INSPECTION REJECTION NOTICES ISSUED.

YOU ARE PROVING THAT IT PAYS TO "DO IT RIGHT THE FIRST TIME."

ONE INDICATION OF HOW YOU ARE PERFORMING IS THAT THE INSTITUTE OF NUCLEAR POWER OPERATIONS HAS ADOPTED THE BELLEFONTE PROGRAM FOR PREPARING FOR AN INPO REVIEW AS A GUIDELINE FOR OTHER UTILITIES TO USE. YOU ARE BEING NOTICED . . . BOTH WITHIN AND OUTSIDE TVA.

AND, YOU ARE ACCOMPLISHING THIS WHILE MAINTAINING ONE OF THE BEST SAFETY RECORDS IN TVA.

AS SOME OF YOU KNOW, OUR LOST TIME INCIDENT RATE IS BASED ON LOST MAN-DAYS PER 200,000 MAN-HOURS WORKED. THE GOAL FOR ALL TVA CONSTRUCTION PROJECTS IS TO HOLD THAT INDEX DOWN TO 3.51 LOST DAYS. BELLEFONTE'S GOAL IS 3.25. YOUR ACTUAL PERFORMANCE WAS 2.31 LAST YEAR . . . 34 PERCENT LOWER THAN THE OVERALL GOAL FOR THE OFFICE OF CONSTRUCTION.

I'M AWARE THAT IN THE WAKE OF OTHER NUCLEAR PLANT CANCELLATIONS MANY OF YOU HAVE BEEN CONCERNED ABOUT THE FUTURE OF THIS PROJECT . . . WHETHER BELLEFONTE WILL EVER BE COMPLETED AND WHAT KINDS OF OPPORTUNITIES WILL EXIST HERE AFTER IT DOES BEGIN COMMERCIAL OPERATION.

THE ANSWER TO THE FIRST QUESTION IS DIRECT. OUR CURRENT PLANS ARE TO COMPLETE BOTH BELLEFONTE UNITS AND FUEL LOAD THEM AS SCHEDULED . . . UNIT 1 IN 1987 AND UNIT 2 IN 1989. BELLEFONTE IS AN INTEGRAL PART OF OUR OVERALL POWER SUPPLY STRATEGY FOR THE FUTURE.

OBVIOUSLY, NONE OF US HAS A CRYSTAL BALL TO TELL US HOW THE VALLEY'S POWER SUPPLY NEEDS WILL CHANGE A FEW YEARS DOWN THE ROAD. AND I WOULD BE MISLEADING YOU TO STATE CATEGORICALLY THAT THERE IS NO CHANCE THAT BELLEFONTE WOULD EVER BE DEFERRED. BUT THAT PROBABILITY IS EXTREMELY REMOTE.

OUR BEST FORECASTING METHODS INDICATE THAT BELLEFONTE WILL BE NEEDED TO MEET THE SYSTEM REQUIREMENTS IN THE 1990S AND BEYOND. IN TODAY'S UNCERTAIN ENVIRONMENT, I THINK THAT'S AS CLOSE TO A GUARANTEE AS ANYONE COULD MAKE.

AS FOR PROFESSIONAL OPPORTUNITIES, I THINK THAT BELLEFONTE OFFERS AN EXCELLENT CHANCE TO GET IN ON THE GROUND FLOOR OF SOMETHING BIG. I BELIEVE THAT THE NEW ORGANIZATIONAL STRUCTURE, WHICH PLACES CONSTRUCTION AND NUCLEAR POWER PERSONNEL IN THE SAME OVERALL ORGANIZATION WORKING TOWARD A COMMON GOAL, ENHANCES THE PROBABILITY THAT THERE WILL BE EXCELLENT OPPORTUNITIES IN THE FUTURE FOR TODAY'S BEST PERFORMERS.

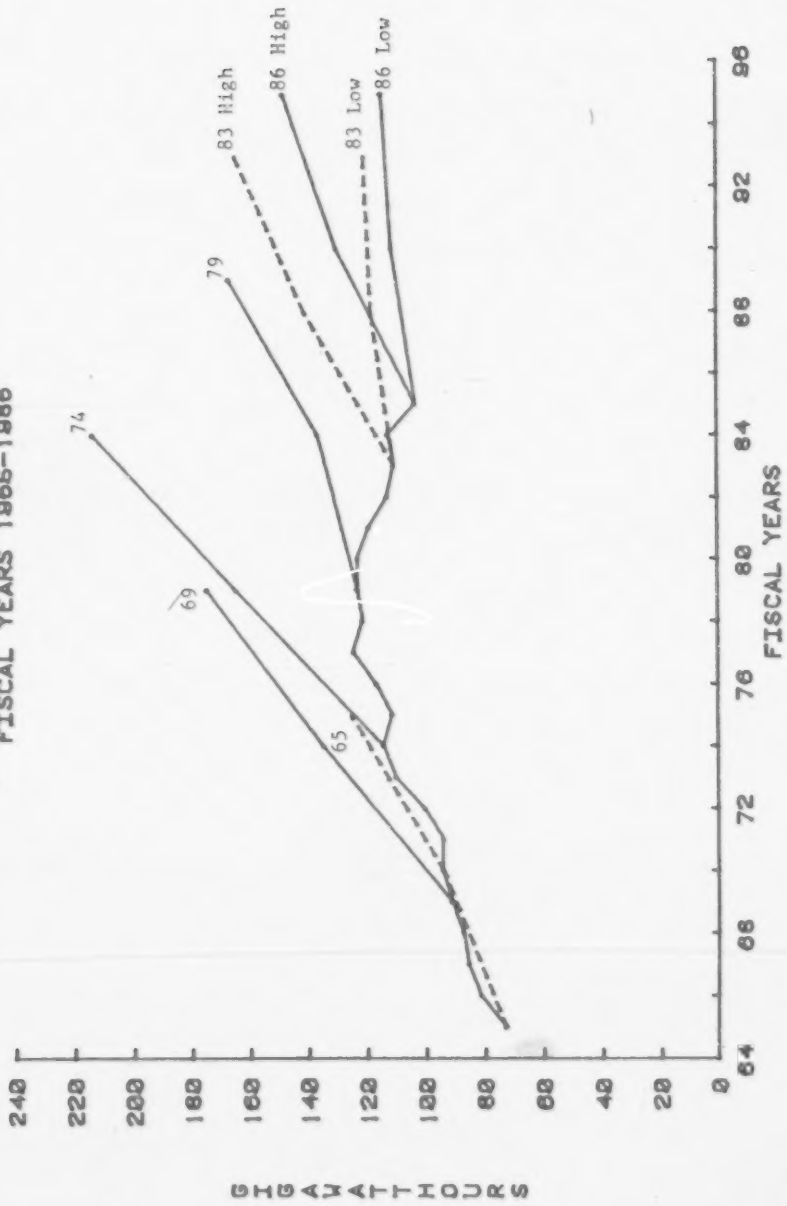
THIS IS A NEW ARRANGEMENT FOR TVA AND I KNOW IT WILL TAKE SOME GETTING USED TO. BUT I'M ENCOURAGED BY THE REPORTS I AM GETTING ABOUT CONSTRUCTION AND POWER FOLKS WORKING TOGETHER TO ACHIEVE PROJECT GOALS. WE ARE ALL ON THE SAME TEAM. WE SINK OR SWIM TOGETHER. AND I THINK THAT YOUR ACCOMPLISHMENTS IN FY 1984 SHOW THAT TOGETHER WE CAN BE PRETTY DARN GOOD SWIMMERS.

IN SUMMARY, I'M DELIGHTED TO BE HERE TODAY AND CONGRATULATE YOU ALL FOR AN EXCELLENT YEAR. I BELIEVE IT'S ACTUALLY MORE IMPORTANT TO LET FOLKS KNOW WHEN THEY ARE PERFORMING WELL AS IT IS TO POINT OUT THE PROBLEMS. MOST PEOPLE KNOW WHAT THEIR PROBLEMS ARE VERY WELL.

I KNOW YOU MUST BE PROUD OF YOUR ACCOMPLISHMENTS AND I WANT YOU TO KNOW THAT THE REST OF US IN THE POWER AND ENGINEERING ORGANIZATION ARE PROUD OF YOU, TOO.

THANK YOU.

ESTIMATED GIGAWATT-HOUR SALES FISCAL YEARS 1965-1986



TESTIMONY OF CONGRESSMAN JAMES H. QUILLEN
BEFORE THE SUBCOMMITTEE ON REGIONAL AND
COMMUNITY DEVELOPMENT OF THE SENATE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

JULY 16, 1985

Mr. Chairman, and members of the subcommittee, I appreciate this opportunity to appear before you as you conduct these oversight hearings on the Tennessee Valley Authority.

TVA is an oddity in the Federal Government, because its headquarters are in the region it serves, and not here in Washington. Its managers and policy-makers live there, know the people, and see the problems first-hand. Its day by day decisions don't have to be sent here for administrative review by someone far removed from the scene.

This avoids at least a part of the various procedures and obstacles that can cause delays and discourage initiative in government action today.

For example, when serious pollution problems turned up in Boone Lake in upper east Tennessee, TVA was quickly able to begin determining the amounts and sources of pollution, and in cooperation with others is drafting a plan for water quality management. This plan will identify actions that can be taken by the state, local governments, and private landowners to protect water quality.

When local concerns developed about deterioration of one area's groundwater, TVA drew up a demonstration project using that area as a proving ground for approaches that can be used elsewhere. In this demonstration project TVA is measuring the quality of groundwater supplies, identifying the recharge sources, analyzing the land uses that affect groundwater quality and developing ways to safeguard groundwater supplies in the future.

This project can serve as a model for many rural areas in the region and nationally where groundwater is the basic source for domestic water supplies.

Most current programs dealing with groundwater have acted only on an emergency basis, after acute contamination is discovered. More information is needed on how contamination moves through the soil and finds its way into our underground water supplies, and what practical steps can be taken to protect this critically important resource. Because of TVA's long involvement with water resources of the Tennessee Valley, it is in a position to play a valuable role in this national effort.

TVA cooperates with state agencies in this work. It has a memorandum of understanding with the Environment Protection Agency that defines their respective responsibilities in this field. And TVA is a member of the new interagency committee organized by EPA to coordinate groundwater protection efforts on a national basis.

Other programs have been developed by TVA to help counties and cities in the region take advantage of opportunities to create jobs. These programs are also successful because TVA specialists and decisionmakers understand the region's local needs. Programs can be tailored to fit these local needs rather than following standardized criteria drawn up in Washington.

In Johnson County, Tennessee, a major local industry closed its doors and laid off over 300 workers, adding to a local unemployment level that was already high. When another company was found that was willing to lease and operate that plant, TVA helped the county put together a financial package for acquiring and leasing the property. As a result, 250 jobs were created to soften the blow of the previous plant shutdown.

TVA was able to supply the final critical element in this package through its Special Opportunities program, dealing with local counties and communities where income and employment are below average.

TVA also is able to help tailor job skill training programs to the specific needs identified by area industries. TVA helped our state and local officials develop a high-technology training program for new and expanding industries in upper east Tennessee. Under state programs, some 9,000 employees are being retrained in these advanced technical skills needed by manufacturing firms already located in the area.

This training helped to keep a major electronics plant in the area, and enabled another company to change its industrial processes to become more competitive in the world economy. An estimated \$8 million a year in increased wages has been generated in the area as a result of this training activity.

Another TVA program helps create jobs by offering various kinds of technical assistance to existing industries in carrying out expansion programs. During the past eight months TVA has worked with ten firms in upper east Tennessee, providing 22 specific technical services and helping these firms create 240 new jobs. Generally these are services that local industries do not have available on their own, but that TVA can readily provide out of its staff experience in various fields.

As you can see, these activities fit the concept of offering a hand up rather than a handout. All of these examples reflect the characteristics that give TVA a special value to the region and the Nation.

It is located in the Tennessee Valley region, making it accessible to the people and familiar with local circumstances.

It has more flexibility in originating new approaches than most programs that operate on a national scale.

Its broad mission provides a wide range of skills and experience that can be focused on specific needs and situations.

Its national demonstration role uses these skills and experience to develop answers that can be used successfully elsewhere.

The basic structure of TVA has stood through many different periods with different national needs and priorities--in depression and war, times of rapid economic expansion, concerns about the environment and energy supplies, periods of economic uncertainty and change. TVA has helped the Nation find ways to meet all of these demands, and it continues to be a national asset today.

Statement by Rep. Bill Boner
before the Subcommittee on Regional and Community Development
Committee on Environmental and Public Works
U. S. Senate
July 16, 1985

Mr. Chairman, I appreciate the opportunity to submit a statement in conjunction with this oversight hearing on the Tennessee Valley Authority (TVA). I am sorry that I was unable to attend the July 16 hearing in person.

As you know, all of us in the Tennessee Valley region have had a close working relationship with the agency's Board of Directors and key staff members. Overall, I have found that these men and women have a deep commitment to serving the people of the region and the Nation. However, I certainly don't think they are perfect, and on more than one occasion I have called them to task for what I felt were mistakes of commission and omission.

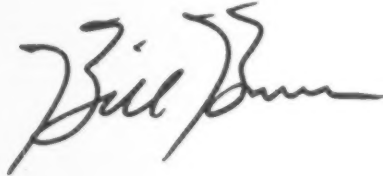
As a member of the Appropriations Subcommittee on Energy and Water Development which provides funds to the Authority, I am keeping a close watch on the many activities of TVA to ensure that they are creating the results intended, that they are not duplicative of other agency's programs, that they are terminated when their purposes have been accomplished.

In preparing this statement, I reviewed the questions I posed about agency operations as it appeared before our subcommittee for its FY 1985 appropriations. The discussion included public access to the TVA Board, Columbia Dam, rate increases, the appropriations request, pay cap for employees, personnel levels, the uranium settlement, electricity demand, acid

rain, job training, pending litigation, cost allocation of TVA's projects, and TVA's relationship to the nuclear industry. The subcommittee traditionally has asked numerous questions about TVA's power program, which does not receive appropriated money, because of our concern about electric power customers. We have also kept a close watch on the appropriated account to protect the interests of the Nation's taxpayers.

I believe the record shows that we have provided TVA with sufficient funds to carry out its mandate, but we have only approved lean budgets. I hope you will consider these facts as part of your appraisal of the agency as chairman of its Senate oversight subcommittee.

Again, I appreciate the opportunity to submit these brief remarks which I request be made part of the hearing record on the Tennessee Valley Authority.

A handwritten signature in dark ink, appearing to read "Bill Bunn". The signature is fluid and cursive, with a large, stylized initial "B" and a long, sweeping underline.

BEN ERDREICH
8TH DISTRICT, ALABAMA

COMMITTEE ON BANKING, FINANCE
AND URBAN AFFAIRS

COMMITTEE ON GOVERNMENT
OPERATIONS

SELECT COMMITTEE ON AGING



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Congress of the United States
House of Representatives
Washington, DC 20515

June 27, 1985

The Honorable Gordon J. Humphrey, Chairman
Subcommittee on Regional and Community Development
Committee on Environment and Public Works
United States Senate
Washington, D.C. 20510

Dear Mr. Chairman:

Although the Tennessee Valley Authority service area is a small portion of the district I serve -- about 2800 homes and businesses receive T.V.A. electricity -- I am writing to express my support for T.V.A. programs because of the benefits beyond my district.

I am sure you are aware that the National Fertilizer Development Center at Muscle Shoals, Alabama, is the nation's only entity for developing new fertilizers and fertilizer technology. The work of this center reaches to almost every state and has resulted in a close and creative partnership involving T.V.A. and the land-grant universities. This partnership has benefited farmers and consumers. To change this successful arrangement without careful consideration on the part of Congress would not be, in my opinion, in the national interest.

Furthermore, there is no organization better able to carry out research and demonstration efforts on a wide range of concerns, such as air quality, productive and environmentally sound farming, forestry, land reclamation, and economic development than T.V.A. Instead of considering cutting back T.V.A.'s efforts, the Congress should maintain a reasonable level of funding for T.V.A. so that it can continue to carry out problem-solving programs for use in other parts of the country. As a result of its broad mission, T.V.A. has developed an experienced staff with education and experience in many disciplines, and it would be a national mistake to break up this pool of talent. I do not believe there is another entity, public or private, which has so much expertise under one roof that can be utilized with such a modest investment.

I appreciate your giving my comments consideration, and I hope this letter will be made part of the hearing record.

Sincerely yours,

Ben Erdreich
Member of Congress

BE/pc

TESTIMONY OF CONGRESSMAN BART GORDON
SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
SUBCOMMITTEE ON REGIONAL AND COMMUNITY DEVELOPMENT

.I want to thank the distinguished Chairman and the Members of the Subcommittee on Regional and Community Development for the opportunity to evaluate the contributions of the Tennessee Valley Authority (TVA) to the Tennessee Valley region and the economic development of the country.

.First, Mr. Chairman, we all share in the goal of reducing the mounting federal deficit so that interest rates can come down and we can create more and better jobs for all Americans and TVA must do its part. However, it is my belief that a 70 percent cut in the non-power budget is unfair, unwarranted and unwise. TVA must not become a scapegoat in the search for easy ways in which to make hard choices.

.While I will be the first to admit that some of TVA's programs need reform and some of its management decisions may be misguided, an additional budget cut of 70 percent on top of a 40 percent reduction over the past four years will result in long-term economic troubles for the Valley region and, further, deny it some of the tremendous benefits that have developed from TVA's work. I also believe that all federal agencies should demonstrate their ability to carry out their defined and self-proclaimed responsibilities. Allow me a few minutes to outline some of these benefits.

.Environmentally, over the past 6 years TVA has invested nearly \$1 billion to reach the ultimate goal of reducing emission from its coal-fired power plants by more than 1 million tons per year. New coal scrubbers, and coal cleansing techniques further add to better air

quality.

.TVA's Energy Conservation Program is one of the most advanced in the country. Through energy conservation efforts last year, TVA made 89,000 homes more energy efficient which, in turn, saved 2.4 billion kilowatthours. Over 40 percent of the newly weatherized homes were occupied by low-income families.

.The elimination of TVA's natural resource program would be truly disastrous. The National Fertilizer Development Center is this Nation's premier facility which creates fertilizer and fertilizer technology. Since its establishment in the 1930s, this facility has produced 75 percent of all fertilizers used in agriculture today.

.TVA efforts in soil conservation are second to none. Because of TVA's work with state and local governments, portions of this country that once experienced soil erosion of 20 tons per acres now enjoy--on the average--4 tons per acre.

.At a time when many people are out of work, TVA is increasing its resources to meet the changing needs of industry. The Existing Industries Program (EIP) is a prime example of this leadership. EIP works to create new job opportunities by helping the region's existing manufacturing firms expand. This program is a phenomenal success. In 1983--its first year--1,200 jobs were created followed by 2,490 in 1984 and an anticipated 3,000 in 1985.

.Especially important to my district is the Special Opportunities Counties and Cities Program (SOCC). TVA works with local citizens in

economically depressed areas to develop job-creating projects which will ultimately compete for financial assistance through SOCC loans.

.Mr. Chairman, I could continue highlighting the beneficial programs and projects TVA has developed over its 52 year history. But I think reviewing a few of the facts my distinguished colleague Senator Sasser pointed out earlier would make my point even clearer.

.The TVA power program is a self-sufficient and self-financed program. In all, the Federal government invested \$1.4 billion into the development of the many dams and power plants that make up the TVA power network. Since 1959, TVA has repaid to the Treasury a total of \$1.9 billion in this country's original investment. Additionally, in 1984 rate payers put \$113 million back into the U.S. Treasury's pocket. This repayment included interest computed at today's rates.

.In summary, Mr. Chairman, TVA is as important to the 6th Congressional district of Tennessee as it is to the residents of the 201 counties that are spread throughout the 7 state region.

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Testimony
of
The Honorable Bill Hendon
before
The Senate Committee
on
Environment and Public Works

July 16, 1985

Mr. Chairman and Members of the Committee:

It is a pleasure to have this opportunity to appear before the "other body" to share with you how important TVA is to Western North Carolina and its future economic development.

My area is different from most parts of the Tennessee Valley. The headwaters of three of the Valley's major tributary rivers are in our mountains of Western North Carolina, and there are several TVA dams. But only two counties in this area use TVA electricity, and people downstream in other states receive most of the flood control and river transportation benefits of the TVA system.

Instead, the benefits to Western North Carolina come from TVA's general resource development activities in agriculture, economic and community development, and natural resources.

These are the programs that would be essentially eliminated under the proposed 1986 Federal budget.

These TVA activities in our area do not draw a great deal of attention, and they do not involve very large expenditures. In these fields, TVA works alongside state and local agencies to help overcome problems in a way that produces important benefits over the long run. Many of these lessons are then applied elsewhere.

Let me give you a few examples. The small family farm has always been a mainstay in our economy. But as you know, the family farm has been under economic assault for a generation or more. And in Western North Carolina its problems have been magnified. The steep mountain land and small plots restrict the use of large, efficient machinery. The limited resources of the people make investment in modernization difficult.

Back in 1957, TVA and the Agricultural Extension Service saw the need for a dramatic change, however, if the family farm was to survive. That change would have to offer the potential for increasing family income in these small farms, and it must be a change that the farmers themselves would accept and manage successfully.

The answer was high-value specialty crops-tomatoes, cabbage, ornamental shrubbery for landscaping, and Christmas trees. These are crops that can be grown on small mountain plots with family labor. Little investment in expensive equipment and supplies is required.

But to make this shift successful, agricultural specialists from TVA and the Extension Service had to come up with specific information on production methods, soil fertility, pest control, and marketing, and get this information to farmers in a form they could understand. The TVA principle of demonstration-farmers learning from each other-was used.

One farmer back then agreed to grow two acres of tomatoes. The next year, 30 farmers grew 18 acres. Then the whole enterprise began to spread. In ten years, more than 2,100 farmers in Western North Carolina were growing tomatoes. This sparked other economic activity: 17 packing sheds invested more than \$1 million; boxes and paper for packing cost more than \$2 million, and farmers spent more than \$1.5 million on new equipment.

The TVA principle of demonstration continues. Today, the tomato business has settled down into a long-term enterprise supplying needed cash to help many farms survive. Last year, growers harvested nearly \$15 million worth of tomatoes from 1,250 acres. The ornamental shrubbery and Christmas tree businesses also have prospered in the area. Last year farmers grossed \$12.5 million from Christmas trees and almost \$10 million from ornamental shrubbery.

In total, that's \$37 million in "new money" that is being pumped into the agricultural economy of Western North Carolina every year. And more importantly, the experience in Western North Carolina is being duplicated in other areas of the Tennessee Valley and the Nation.

TVA, which is widely known as the foremost fertilizer research agency in the country through its National Fertilizer Development Center, is also working effectively with small farmers throughout the Tennessee Valley. It is demonstrating how they can make changes that will help them survive in today's highly competitive economy. These are lessons the nation needs to learn in its struggle to maintain the family farm.

In another field involving our area's natural resources, TVA has just completed reclamation of 600 acres of badly eroding land that had been mined for mica, feldspar, and clay earlier in this century and then abandoned. This abandoned land produced nothing for the economy, but contributed millions of tons of silt and sediment to the streams and rivers flowing through the area.

The work was undertaken jointly by TVA, the State of North Carolina, the U.S. Soil Conservation Service, local county governments, and private landowners-who agreed in advance to maintain the reclaimed areas.

All of the 600 acres identified as needing treatment have been returned to productive use for forest and wildlife. In some cases the private landowners have gone even further and are using some of the lands for pasture and livestock. The effectiveness of the work in controlling erosion is reflected in the comments of downstream residents who have remarked about how clear the streams are flowing this year.

The whole country benefits when steps are taken to conserve its soil and preserve its water resources.

Over the years TVA has built the knowledge and experience to deal with many natural resource needs. TVA is helping our state wildlife agency restore nesting populations of golden eagles and peregrine falcons to our mountains. It is providing technical information and advice to about 80 forest-related industries in our area. It is helping many of our communities plan for the wise use of their floodplain lands. It has helped provide public access points along many of our scenic rivers, where the recreation-minded can put in their canoes and rafts without interfering with private property rights.

Some of TVA's most useful programs today are in the areas of job creation and skills development. These are designed to meet an urgent need, particularly among our young people just entering the labor force and among some of our older workers who find their skills obsolete in this fast-changing economy.

The problems these programs address are not limited to Western North Carolina, but are regional and national in scope. Ideas and techniques that work in one place can have immediate and direct application elsewhere. Let me mention a few specific projects.

First, there's the new High Technology and Robotics Training Center now being completed at Haywood Technical College. The concept for this center originated when some of the local people visited a somewhat similar project involving TVA at Chattanooga, Tennessee—an example of how successful ideas are transferred from one area to another.

At the new center, workers will be trained in automated manufacturing systems, computer-aided design, and robotics—skills that local industries said they would be needing in the future. The center also will retrain employees from specific local industries to use the new high technology equipment being installed by such industries.

The state, the county, and others are contributing toward construction, equipment and operation of the center.

Going up adjacent to the High Technology and Robotics Training Center is another building that will demonstrate yet another approach to job creation and economic development. It is called a Small

Business Incubation Center. It represents an approach that TVA is demonstrating elsewhere, and it is a first in North Carolina.

The idea is to help new, small businesses get started on the right foot by housing them together where they can share overhead expenses and can gain help in management and business techniques from qualified experts attached to the nearby educational institution.

Small businesses provide a significant proportion of new job opportunities in this country, but their success ratio during the first couple of years of their existence is poor. If we can help them overcome initial startup problems, they have a much better chance of survival when they move out on their own.

In a somewhat related move, TVA is helping sponsor a study to identify opportunities for new "home-grown industries" that can supply products now being used but not being manufactured in the area.

Realizing that many new jobs can result from expansion of existing industry, TVA offers technical assistance and training help to industries interested in expansion.

These programs in total represent a comprehensive and innovative approach to job creation.

The people in Western North Carolina don't see many of TVA's power plants and transmission lines, nor many of its large dams and locks and its navigation channel carrying large barge tows of freight. They don't see its complex fertilizer laboratories and greenhouses.

But people in Western North Carolina do see how TVA is important to the economic development of Western North Carolina. Many opportunities would be lost if the Congressionally supported programs in agriculture of TVA were eliminated.

I have mentioned programs in agriculture, land reclamation, and job creation. These are all areas of national concern that are being addressed in a quiet but effective manner by TVA. They are programs worthy of support because they are needed, and because nobody else is capable of bringing them all together under a single, unified umbrella of economic development.

TVA has both the breadth of expertise and the flexibility to respond effectively to local needs. It can demonstrate to the Nation solutions to some of our most pressing natural resource and economic development problems.

Thank you, Mr. Chairman and Members of the Committee.

STATEMENT OF REPRESENTATIVE ED JENKINS
BEFORE THE SUBCOMMITTEE ON REGIONAL AND ECONOMIC DEVELOPMENT
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

Mr. Chairman and Members of the Subcommittee:

I am pleased to appear here today and have the opportunity to comment on TVA's programs.

Since its inception over half a century ago, TVA has been helping the Tennessee Valley region make the most effective use of its human and natural resources. While there are many unique and cost-effective TVA programs, I would like to focus on three innovative economic development programs: TVA's Existing Industries Program, its Special Opportunities Counties and Cities Program, and its Townlift Program. These programs capture the spirit of TVA's activities in the State of Georgia and in the region. The success of these programs vividly refutes OMB's claim that TVA is just a power producer whose nonpower programs merely duplicate the activities of other Federal agencies.

Before describing these programs, I would like to emphasize that TVA is not an agency that throws money at problems. To the contrary, TVA's economic development activities are distinguished by TVA's commitment to promote the growth of the private sector and to respect local needs and priorities. Such programs build community self-reliance and not

long-term dependence on public funding. For this reason, technical assistance--the provision of expertise and not grants--is TVA's primary community development tool. TVA technical assistance, sometimes coupled with seed money from State or Federal taxpayers, helps communities and industries organize, set goals, and harness the energy and resources of State and local governments and the private sector. This approach has been remarkably successful and cost effective.

Existing Industries Program

Plant expansions of existing industries have created over 60 percent of the new manufacturing jobs in the Tennessee Valley. Since most new manufacturing jobs are created by growth from within, TVA established the Existing Industries Program (EIP) to help existing manufacturing firms in the region be as efficient as possible, lower their operating costs, and plan for new expansions. Through the EIP, TVA helps the private sector create jobs by providing a wide range of technical services in concert with State and local agencies.

Through the EIP, TVA offers technical assistance and services that are not duplicated by other government agencies. EIP services include energy management surveys, transportation studies, marketing research, waste disposal and pollution control analyses, and financial resource identification, to name just a few.

During its first two years (fiscal years 1983 and 1984), when it was conducted as a pilot program at selected locations, EIP representatives provided technical assistance to 102 firms and helped create nearly 3,700 new jobs. Beginning this fiscal year, TVA expanded its EIP program to cover the entire TVA power service area, and during the first seven months of TVA's Valley-wide effort, the EIP staff have worked with 154 firms and helped create nearly 6,800 new jobs. In just two and one-half years, this innovative program has created over 10,000 new jobs in the private sector.

Perhaps the best measure of this program's success is the interest and favorable comment it has generated from economic development organizations and State and local governments all over the country. For example, the National Rural Electric Cooperative Association, representing rural electric cooperatives nationwide, has used the EIP and other TVA economic development activities as the basis for a new job development program. It is my understanding that this program will be used by their membership throughout the Nation. According to reports, the State of North Carolina is considering adopting the EIP in its entirety, and similar inquiries have been received from the States of Oregon and Minnesota.

A north Georgia project provides one example of what the EIP program can accomplish. In this project, TVA's EIP representatives worked with 27 north Georgia manufacturing firms. The resulting plant expansions created about 1,500 new private sector jobs.

Part of TVA's assistance in this project included the payment of a training subsidy to help participating businesses defray the cost of training new workers. TVA paid \$450 for each new employee who was trained and retained by a participating employer. Only long-term unemployed workers were eligible for such retraining, and the \$450 cost to TVA for each retrained and employed worker was usually less than what the unemployed worker would have received in unemployment payments and other forms of public assistance during the training period. When unemployment costs, other public assistance costs, increased Federal, State, and local tax revenues, and increased personal income for employed workers are all taken into account, the benefit-cost ratio of this project is about 20 to 1.

Townlift

Townlift is a valuable TVA program that focuses on the economic revitalization of a community's business district, where many small businesses are concentrated, and on job creation in the city's services sector. Like other TVA community development programs, TVA provides the technical tools to small- and medium-sized communities that want to help themselves. During 1984, a total of \$25 million in public and private funds was invested in Townlift activities in 68 communities. This investment results in a leverage ratio for TVA funds which exceeds 25 to 1.

The Townlift program has helped communities in north Georgia organize, focus on their development needs, and apply local resources and talents in a productive way. I would like to describe a few of these success stories.

- In Dalton, Georgia, TVA provided \$10,000 in seed money and technical assistance to help organize the Dalton Development Authority. This authority is now entirely supported by local funds and directs the community's economic development efforts. So far, the Dalton Development Authority has fostered over \$1 million in improvements in the downtown area.
- In Blue Ridge, Georgia, the Townlift Program is helping create a high-quality downtown area. The focus of this project is a restored railroad depot; and TVA is participating, with others, in a project that has made numerous public improvements to the downtown area (improved parking, lighting, and landscaping) and recruited 13 new businesses.
- In Blairsville, Georgia, TVA's Townlift representatives are helping the community recruit new businesses and improve existing structures to revitalize the downtown area. Part of this project includes a "Merchants Walk" downtown mall which already has four new businesses. Townlift plans for this community include the development of a "small business incubator" to help new small businesses get established, further improvements to existing downtown buildings, and completion of the Merchants Walk development.

This program shows how much TVA can accomplish when its expertise is used to help communities that want to help themselves. The reason such programs are successful is that TVA serves as the catalyst for changes sought by the community.

Special Opportunities Counties and Cities

The last program I would like to describe is TVA's Special Opportunities Counties and Cities (SOCC) program.

At least 50 Tennessee Valley Counties in the 201-county TVA region lag far behind the rest of the Valley and the Nation in economic development. To promote the economic growth of these poorest counties, TVA developed an innovative program that has the potential for national application. The SOCC program focuses on those activities that create jobs and increase per capita income in counties which have--

- per capita incomes of less than half the national average, or about \$5,000;
- high unemployment, between 15 and 25 percent;
- Federal transfer payments that comprise as much as 30 percent of the total county personal income; and
- local governments with extremely limited capital resources.

Like other TVA programs, SOCC activities are tailored specifically to local needs and opportunities that are identified jointly by TVA and area leaders. Typical activities include support for business and industrial development, agricultural marketing efforts, and other projects to increase the productive use of forest and other natural resources.

The number of jobs created by TVA's SOCC program shows that momentum is building in many of the rural areas that need economic growth. For

example, the SOCC program created an estimated 1,500 jobs in fiscal year 1983, and about 2,400 jobs in fiscal year 1984. It is estimated that the program will create nearly 5,000 jobs in this fiscal year. Like the other TVA programs I have described, the SOCC program is extremely cost effective--one permanent job has been created for each \$2,000 to \$4,000 invested.

Among the SOCC program's accomplishments are a number of activities in Union and Fannin Counties in north Georgia.

In Union County, TVA helped local leaders promote the expansion of an existing industry which created 340 new jobs. In addition, TVA worked with the local industrial development authority and the State of Georgia to promote the construction of a building for a manufacturer of precision electromechanical components. The manufacturer is currently leasing the building from the local development authority and employing 250 workers.

In Fannin County, SOCC assistance has been provided in connection with the renovation of the L&N Railroad Depot as part of a downtown revitalization and tourism effort.

In north Georgia, approximately \$850,000 has been invested in recent years, and a total of 640 new permanent jobs have been created. The ratio of dollars per job in north Georgia is about \$1,330 for each new job created.

Mr. Chairman and Members of the Subcommittee, these three programs are typical of a number of TVA programs that are carefully targeted and cost effective. These programs are paying large dividends on a small investment. They are a real bargain for the Nation's taxpayers.

It is unfortunate that OMB's budget would eliminate these programs. The OMB proposal ignores TVA's past contributions and rejects completely the valuable contribution these programs would make in the future. This is not a sound choice. It may save us some today, but it will cost us much more tomorrow. I think that the testimony at this oversight hearing is proof positive that TVA is on the right track and forging ahead on the mission that Congress directed.

This concludes my prepared remarks. I would be glad to answer any questions that you might have.

STATEMENT OF REPRESENTATIVE ED JONES
BEFORE THE SUBCOMMITTEE ON REGIONAL AND COMMUNITY DEVELOPMENT
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

JULY 16, 1985

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE:

I appreciate this opportunity to testify before the subcommittee today as it continues to review the performance of the Tennessee Valley Authority. I think I can present to you a unique viewpoint for a number of reasons. In addition to being in a policy making position as Member of Congress involved in a number of TVA related activities, I am old enough to remember what my region of the country was like without TVA. I can tell you today that the difference is beyond imagination.

Having said that but before I go any further, let me assure you that though I fully appreciate what TVA has done in the past, I readily admit that it has made some mistakes and has received a justifiable amount of criticism for them. Nonetheless, its work remains vitally significant to the people of the Tennessee Valley.

TVA continues to provide a unique brand of productive partnership with the people it serves. It provides a small cadre of well trained technicians to provide assistance to state, local, and private entities to achieve goals that might not otherwise be possible without the expertise that the TVA technicians bring to the task. Let me make it clear that TVA assists its constituencies by committing its experience and expertise rather than grant dollars to demonstration efforts that can be applied to other areas while respecting local priorities and values.

I would like to offer you two illustrations on how this demonstration effort works. I was involved in both of these situations but I want to emphasize to you that they are typical of many other projects in which TVA has committed its resources for short and long term benefits. In the first case, TVA agreed to become involved in a multi-agency effort to arrest what were extremely high rates of soil erosion in West Tennessee, an area that encompasses 20 counties of the most productive farm land in Tennessee. That effort involved the Soil Conservation Service, the Agricultural Stabilization and Conservation Service, the University of Tennessee Extension Service, the Tennessee Department of Agriculture, the Obion Forked Deer Basin Authority, the Tennessee Rural Development Committee, several conservation districts, and a host of local governments and area farmers.

TVA played an important role in the development of a demonstration project aimed at showing local land owners how conservation techniques could be incorporated into their farm operations and focused attention on the severity of the erosion problem and its eventual impacts. TVA continues to provide technical expertise in the West Tennessee project working with other federal agencies to retain public awareness on both the problem and the best methods of curtailing soil erosion throughout the valley.

Already, the effort has produced remarkable and encouraging results. At demonstration farms where the project was undertaken, the soil loss dropped from 18 tons per acre per year to 6 tons a year. Since the program began, we estimate that more than 51 million tons of topsoil have been saved.

Mr. Chairman, this is just one example of a TVA project that can be applied to other areas of the valley and the entire nation. Soil erosion has reached critical levels throughout the nation. Though TVA is not the only agency devoting time and energy to this problem, it does bring a tradition of innovative approaches to it that accelerates the work of all entities, both public and private, who recognize soil erosion as one problem that threatens our nation's status as the breadbasket of the world.

In addition to its work in soil conservation, TVA has also been active in seeking ways to improve farm income, improve the stability of small farms, and promote farmer's cooperatives as a way of achieving those goals. Just this year, TVA was instrumental in providing assistance to a small group of local tomato growers in Lauderdale County Tennessee who had organized a cooperative. Unfortunately, until TVA technical expertise came into the picture, the cooperative and its organizers did not have the experience and know-how to go much beyond a small, struggling operation. TVA joined with local government officials and the cooperative in providing guidance that should bolster the chances of success for the cooperative in the future.

This is not the only case of TVA providing this kind of assistance. It did so in Alabama for a corn cooperative. In both cases, TVA efforts strengthened the cooperative in such a way that should allow for growth and possibly diversification in the future. These kinds of efforts are important as farmers nationwide seek ways to improve their financial situation.

We have all read and heard about the problems in agriculture. This kind of technical assistance and demonstration project can be used to provide encouragement and offer a viable alternative to farmers who are finding extreme difficulties in their traditional farming operation. Moreover, in the case of the tomato cooperative, TVA's effort greatly compliments the work of Tennessee's state officials who have been encouraging a turn to more truck farming throughout the state.

Mr. Chairman, I don't want to belabor the point, but I do want to make sure that this committee understands fully the transferability of projects such as those I have mentioned to applications throughout the country. TVA serves its people well and beyond that serves the interests of the nation well by maintaining a wide diversity of expertise available through no other federal agency. Certainly, its shortcomings should be pointed out and corrected. In doing so, I would hope that we differentiate between errors of neglect or bad judgement and those mistakes that are the results of attempting innovative solutions to complex and persistent problems of great importance to our entire nation.

TVA confronts a wide variety of water, natural resource, and energy conservation problems. In doing so, and by seeking imaginative and innovative solutions to those problems, it establishes models for others.

Thank you.

STATEMENT OF MARILYN LLOYD
U.S. HOUSE OF REPRESENTATIVES
BEFORE THE SUBCOMMITTEE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE
JULY 16, 1985

Mr. Chairman, I appreciate the opportunity to provide testimony to this subcommittee on the importance of the Tennessee Valley Authority, not only for my own Third District in Tennessee, but for the Tennessee Valley and the United States as a whole.

While TVA's mission has been the same for more than a half-century--from flood control to power production, development of fertilizers, economic development, and conservation and development of natural resources -- the methods to achieve these goals have changed dramatically. The ways in which TVA has adjusted to change demonstrate the wisdom of the Congress in creating this regional development agency and providing it with sufficient flexibility to alter its programs as the times have demanded.

For example, TVA's power system has undergone tremendous changes in the past 10 years. As electrical demand forecasts have shrunk, TVA has reduced the number of nuclear power facilities on the drawing board. At the same time, adjusting to a combination of higher fossil fuel prices and gradually rising electricity production costs, TVA determined that it was in its own best interests as well as those of the ratepayers (to whom Congress requires that power be delivered at "lowest feasible rates") to embark upon a major conservation program, coupled with stepped up energy research and demonstrations to improve efficiency at existing power plants.

TVA's major goals were to:

- Save money for consumers by reducing energy waste;
- Save power system funds by reducing demand for high-cost peak power and delay the need for new central generation station construction;
- Develop a way to rapidly reduce electrical demand in the event of emergencies.

Since 1977, the most significant conservation accomplishment has been TVA's home weatherization program, which helps consumers reduce their use of electricity for heating, cooling, and water heating. Consumers obtain loans from distributors of TVA power for material and labor costs covering attic and floor insulation, storm windows, insulated doors, caulking, water heater insulation, and weatherstripping costs. The loans are repaid to the local distributors of TVA power in equal monthly payments along with the consumer's electric bill.

Since the program began, over a million homes have been surveyed and about half a million homes have been weatherized. Some 900 weatherization contractors are now participating in the program. TVA sets standards for weatherization materials and contractors may be eliminated from TVA's approved list if they fail to meet TVA standards or for poor performance. By 1990, this program is expected to save the TVA power system more than 5 billion kilowatthours annually and defer the need for 1400 megawatts of new electrical generation capacity. As you may be aware, Mr. Chairman, many private utilities throughout the country have been developing their own weatherization packages for residential customers, modeling them after TVA.

TVA's residential energy program also provides for loans to purchase heat pumps which, compared to a central electric furnace, can save

consumers an average of \$355 a year. Solar water heaters and wood heaters are covered by this program as well.

Another innovative TVA program focuses on electric load management. Designed to reduce demand on the power system during hours of peak electric use, this program provides for cycling switches to be installed on central air conditioners, heat pumps, or electric water heaters of consumer-volunteers.

Under this "cycle-and-save" program, TVA may interrupt the flow of electricity to selected appliances by radio signal during times of peak demand when TVA's energy costs are highest. In return, consumers receive monthly credits on their electric bills of up to \$7 per month. Again, both consumers and TVA benefit.

Another load leveling technology that would have the added benefit of reducing demand for gasoline is the electric vehicle test program. In cooperation with the Department of Energy, U.S. Postal Service, and the Electric Power Research Institute, TVA has tested 15 different types of electric vehicles and 11 different battery systems at its test facility in Chattanooga.

Evaluating operating costs, performance, and reliability, TVA has been instrumental in introducing European advances in electrical vehicle technology into the United States and has assumed a leadership role in the international effort to bring the electric vehicle into wider use. The advantage of electric vehicles to the power system is that of recharging the vehicles' batteries during the nighttime off-peak hours. This helps balance TVA's load factor, while at the same time reducing United States dependence on foreign petroleum, cutting back air and noise pollution in

urban areas, and providing an economical means of commuter or second car transportation. As with TVA's residential energy conservation program, the electric vehicle effort has national application.

TVA is aggressively pursuing one other alternative to gasoline through efficient and economical processes that would convert hardwood to ethanol. In the Tennessee Valley alone, TVA estimates that there are 25 million tons of unused surplus hardwood. If a successful technology can be developed, and commercialized--a process that would take a decade or more--35 to 40 percent of the 4 billion gallons of gasoline used annually in the Tennessee Valley could be displaced.

In my own district, about 1 million tons a year of forest "biomass" could be available for energy use annually. If TVA's studies yield a successful process, this surplus wood could be converted to 32 million gallons of annual ethanol production in my district alone. The economic benefits from such an effort could employ 300 people and yield sales of about \$50 million annually.

At the present time, TVA is monitoring a derivative of the wood-to-methanol process in Grundy County, Tennessee, where a commercial alcohol-from-grain plant is under construction. TVA is cooperating with the Department of Energy in this effort. TVA is also managing for DOE the Southeastern Regional Biomass Energy Program involving grants to researchers from universities and the energy industry.

I would not want this subcommittee to conclude that TVA's ability to adapt to changing times is limited to the energy field. TVA's economic development programs are also forward-looking. One demonstration with which I am familiar involves the development of a high-technology

automated manufacturing "factory of the future" training center at Chattanooga State Technical Community College (CSTCC).

In partnership with the General Electric Company and other private and public entities, TVA helped design a learning center with computer coordination of industrial scale equipment and materials processing that emphasizes computer-aided design and manufacturing. This facility is truly state-of-the-art. Training programs are being conducted for several major companies, including General Motors, DuPont, and GE.

More than 10,000 employees have now gone through this "factory of the future" and the payoff in Chattanooga alone is substantial: two major industries in Chattanooga, with more than 6,000 jobs at stake, decided that instead of closing their plants they would retrain their employees in new skills at the facility. Many educational institutions from throughout the country have consulted with CSTCC about replicating the facility elsewhere. The center is now being operated by a foundation and local industry has already contributed more than \$1.5 million for scholarships, instructor training, and new equipment.

I have been discussing TVA's flexible approach to problems that face both the Tennessee Valley and the Nation for a reason: I want to demonstrate the soundness of the concept of TVA as a multi-faceted regional resource development organization with a responsibility for broad-gauge economic development. TVA's successes over the past half-century have probably surprised its friends as well as its foes. TVA continues to meet the changing needs of the people it serves with both compassion and hard-nosed good business instincts.

Thank you.

STATEMENT OF CONGRESSMAN G. V. "SONNY" MONTGOMERY BEFORE THE
SENATE ENVIRONMENT AND PUBLIC WORKS SUBCOMMITTEE ON REGIONAL AND
COMMUNITY DEVELOPMENT ON JULY 16, 1985

Often those of us who are served by the Tennessee Valley Authority ask for or receive a report on what the authority has done to improve the quality of life in our area and thereby the overall quality of life in the Nation. The announcement of the subcommittee's oversight on TVA prompted me to review the agency's programs and submit this statement in support of the continuing mission of the agency.

I cannot think of another government agency with such a multi-faceted mission. The production of power, fertilizer research, economic development and national resources are only a part of TVA's mission. TVA is known throughout the world; in fact its expertise is utilized by other nations. It would be a tragedy if this agency's programs were severely crippled or eliminated. I share your concern about the Nation's deficits, but I believe there is a strong case for supporting TVA's future work at a realistic spending level.

A large amount of the work carried out by TVA has a ripple effect - work done in one place can be of a positive benefit in another. The agency's program in water quality, for example, is of interest to those of us who have a deep and abiding concern for the Mississippi River. If the Tennessee, which empties into the Ohio, which empties into the Mississippi, had serious water quality problems, it would be only a matter of time before they were felt on the Mississippi River. This is why I am interested in the agency's water improvement program even when the activities are in Saltville, Virginia or Oak Ridge, Tennessee.

STATEMENT OF CONGRESSMAN MONTGOMERY
JULY 16, 1985
PAGE TWO

Another example is closer to home. TVA will spend \$10,000 in FY 1985 in a comparative agreement with Mississippi State University to study the effects of erosion on crop fields and on the use of fertilizer to restore crop productivity on eroded soil. Another \$105,000 will help support three research projects with the University on conservation tillage systems and the economics of conservation. I am convinced this work is in the national interest and will help reduce farm operating costs. These two projects represent just a small part of TVA's overall effort with many land-grant universities to improve American agriculture.

Nitrogen research is another example. TVA says farmers used about 11 million tons of nitrogen in 1983-1984. An estimated 2.8 million tons were lost; a factor which cost farmers \$1.25 billion dollars. It escaped to the air and moved down through the soil beyond the reach of crop roots. TVA is attacking this problem, and work is not confined only to the seven-state Tennessee Valley region.

There are many other examples of TVA's work of national value which I know will be emphasized during the course of these hearings. I would note in closing that money allocated to the Tennessee Valley Authority is an investment in America's future.

TENNESSEE VALLEY AUTHORITY OVERSIGHT

TUESDAY, JULY 30, 1985

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
SUBCOMMITTEE ON REGIONAL AND COMMUNITY DEVELOPMENT,
Washington, DC.

The subcommittee met at 10:34 a.m., in room SD-406, Hon. Gordon J. Humphrey (chairman of the subcommittee) presiding.
Present: Senators Humphrey and Burdick.

OPENING STATEMENT OF HON. GORDON J. HUMPHREY, U.S. SENATOR FROM THE STATE OF NEW HAMPSHIRE

Senator HUMPHREY. Good morning. This is the third hearing of the Subcommittee on Regional and Community Development focusing oversight responsibilities on TVA.

I would like to point out that we have, so far, in the previous two hearings, had many witnesses supporting the status quo, more or less. Seventeen Members of Congress and the Board of Directors, which is 20 witnesses so far who were generally supportive of matters, and we have today 7 who are, in one degree or another, critical.

So I hope that the facts are self-evident that we have more than bent over backward to hear all points of view in this matter. This will not be the last hearing. We intend for this to be an ongoing effort for some months to come.

Today's hearing, again, focuses on the matter of accountability of TVA, and I would observe, having now been immersed in this matter for some weeks, that as far as I can see, at least, TVA is not accountable to its customers in any meaningful way. It is not accountable to the Governors of the TVA States. I would observe that it is not accountable in any meaningful way to the public utilities commissions, to the State legislatures, nor is it accountable at the Federal level to the Department of Energy.

Nor is it accountable to the marketplace, in as much as it can borrow from the Federal Government pretty much when it wants, for whatever purpose it wants, providing it does not exceed its capital of the Federal Financing Bank, where it has a very generous line of credit. Nor is it accountable to Congress in a practical sense, because we in Congress are charged to oversee the entire Federal Government, a task which is, frankly, impossible. So as a practical matter, TVA gets superficial scrutiny once in awhile, every several years, and as a practical matter, therefore, in my opinion, TVA is not even accountable to Congress.

So we will continue, today, to look at the problems of TVA and try to come up with a range of constructive proposals to make TVA accountable.

We will do that by asking our first witness from OMB to testify. Senator Burdick, do you have a statement to make today?

Senator BURDICK. No.

Senator HUMPHREY. Thank you.

Let us ask Ms. Katherine Eickhoff, Associate Director of the Office of Management and Budget, to give us her view.

**STATEMENT OF KATHERINE EICKHOFF, ASSOCIATE DIRECTOR,
OFFICE OF MANAGEMENT AND BUDGET**

Ms. EICKHOFF. Thank you, Mr. Chairman, members of the committee. I am very pleased to be here today to discuss the Tennessee Valley Authority and its financial relationship with the Federal Financing Bank.

I know that both the Director and Deputy Director of OMB had planned to be here today, but unfortunately, they could not make it.

Although I have previously testified before congressional committees on the economic outlook as a private citizen, this is the first time that I will be testifying as Associate Director for Economic Policy of OMB.

This testimony illustrates one of the things I am enjoying about my new job. I am learning a great deal about Federal policies in areas that I previously knew little about.

I am submitting written testimony for the record, and with your permission, will simply summarize the key points.

Senator HUMPHREY. Fine.

Ms. EICKHOFF. If there are any questions beyond my present knowledge, I hope we will be permitted to submit detailed written answers.

As you know, TVA has many responsibilities, including navigation and flood control in the Tennessee River, promoting agricultural and industrial development and providing electric power to parts of seven States in the Southeast.

However, I will focus today only on the power program. By itself, TVA is the largest single utility in the United States, accounting for 5 percent of all electricity generated and about 3 percent of the industry's capital investment. Over the years, this capital investment has been financed in three ways:

From 1933 to 1959, the TVA Power Program was financed through direct Federal appropriations.

In 1959, Congress changed the funding mechanism. They enacted specific provisions for repayment of this appropriations debt, requiring amortization of principal on a straight-line schedule beginning at \$10 million per year and later increased to \$20 million per year, with interest payments being made at the average Treasury borrowing rate as of the beginning of each year.

The unpaid balance of TVA's appropriation debt totaled \$848 million at the end of 1984.

The repayment of this debt is not at issue. In fact, the administration views the arrangement as a model that should be applied to

the appropriation debt of the five power marketing administrations.

Senator HUMPHREY. Good idea.

Ms. EICKHOFF. In 1959, and since then, some additional appropriations debt has been incurred for the power portion of various multipurpose or multiuse projects. TVA pays interest to the Treasury on this additional \$258 million of debt, but there is no provision requiring that this debt be paid down.

From 1959 to 1974, TVA borrowed directly from private credit markets. This agency debt was to be financed by the power program through ratepayer revenues.

The TVA borrowings, by law, are not backed by the full faith and credit of the United States. However, its debt is generally viewed in the marketplace as implicitly having such Federal Government backing.

Thus, TVA debt enjoyed an AAA rating from investment rating services during this period, and they borrowed \$1.8 billion from the public, \$1.7 billion of which is still outstanding.

Since 1974, when the Federal Financing Bank was established as an agency of the Federal Government, all new TVA debt has been FFB financed.

In 1979, the limit on TVA's borrowing was increased from \$15 billion to \$30 billion to meet the needs of TVA's plans for nuclear powerplant construction.

TVA borrows from the FFB for two programs and guarantees borrowing for a third:

For nuclear powerplant construction, TVA's borrowing in 1984 was \$367 million, and the outstanding balance at the end of that year was \$13.2 billion.

For the energy conservation loan program, TVA borrowed \$3 million in 1984 and has an outstanding debt of \$261 million.

In addition, TVA effectively guarantees FFB loans to a private corporation, the Seven States Energy Corp., that owns the nuclear fuel used in TVA reactors.

This arrangement, where a separate corporate entity purchases and leases back fuel to a nuclear utility, is used by many utilities as a mechanism to include the cost of fuel in the rate base only as it is consumed.

By signing these leases, TVA essentially guaranteed \$137 million in borrowing by Seven States Energy in 1984 and has guaranteed an outstanding debt to the FFB that now totals \$1.6 billion.

Senator HUMPHREY. Excuse me for interrupting. Does that also come under the cap of \$30 billion, or is that separate?

Ms. EICKHOFF. I am sorry Senator, I did not hear all of your question?

Senator HUMPHREY. Does the borrowing on behalf of Seven States Energy also come under the \$30 billion cap?

Ms. EICKHOFF. No, technically the guarantee would be separate.

Senator HUMPHREY. That is separate, so that is a way of debating the cap, in a sense. Not that it has come up against it anyway.

Go ahead.

Ms. EICKHOFF. They are a long ways from reaching the cap anyway.

Senator HUMPHREY. That is true.

Ms. EICKHOFF. What are the issues, then, so far as TVA's power programs are concerned?

Three general concerns related to the financing of TVA's power program deserve closer congressional scrutiny. TVA power customers have been and are continuing to receive subsidies as a result of the low cost of FFB financing.

Second, the lack of a firm policy on repayment of debt to the FFB as well as the possible rollover of privately held debt into future FFB debt would result in future subsidies and increase the Federal deficit should these events occur.

Finally, there appears to have been insufficient oversight of the TVA power program.

On past and current subsidies, TVA ratepayers enjoy more than a \$1 billion subsidy over the life of the bonds as a result of the low interest rate on Treasury borrowing compared to the cost that TVA would pay if it were selling its own debt without an implicit or explicit Federal guarantee.

As shown in appendix C of our written testimony, if TVA had issued in the private credit market at AA yields the 37 long term bonds it has sold to the FFB between 1974 and now, it would have had to pay \$5.5 billion in additional interest over the life of the bonds, which would have had an aggregate present value of \$1.3 billion.

Not only do ratepayers enjoy a subsidy relative to private investor-owned utilities, they also get favored treatment relative to customers of Bonneville Power Administration, the other major Federal electricity distributor.

Since 1977, Congress has required Bonneville to pay a market equivalent rate of interest for Treasury borrowing. If these same reforms had been applied to TVA in 1974, its ratepayers would owe additional interest over the life of the debt with an aggregate present value of \$834 million.

The Seven States Energy Corp. enjoys similar subsidized financing from the FFB. In addition, its 5- to 10-year fuel inventory has been financed with 90-day paper, which, in turn, is financed by Treasury borrowings that average several years in maturity.

Because interest rates are usually higher on longer term maturities, this represents an additional subsidy to the users of TVA power.

FFB loan disbursements to the Seven States Energy Corp. and the TVA outlays financed with borrowing add to the Federal budget deficit in the near term because these disbursements are direct Federal outlays.

Over the past 5 years, the deficit impact of TVA financing has been \$7.9 billion.

There are also potential future subsidies. TVA borrowings from the public and from the FFB are only beginning to reach maturity. Substantial amounts of TVA debt will come due in future years: \$50 million in 1986; \$545 million in 1987; \$900 million from 1988 to 1990; \$2.2 billion the following decade and \$5.8 billion in the decade after that.

Based on estimates that TVA made for the April update of the budget, TVA expects to continue borrowing at a rate such that the total amount borrowed over the next 5 years will exceed total pro-

jected revenues generated for repayment over the same period by \$964 million. These projections, which contrast with the decrease in indebtedness of \$125 million projected in the February budget itself, lead to concerns that TVA may seek to roll over its FFB obligations as they come due, instead of paying them off.

TVA may also try to refinance its privately-held debt with new FFB debt.

The likelihood of this possibility is strengthened by TVA's low ratio of current assets to current liabilities, 0.8, well under 1, and its even lower ratio of earnings to interest charges, 0.7.

If TVA debt to the FFB is repaid with ratepayer revenues as it matures, Federal budget deficits would be reduced by the amount of the repayments. But under current law and FFB practices, TVA could simply roll over this debt. Indeed, there is nothing currently to prevent TVA from borrowing additional amounts from the FFB in order to repay maturing privately-held debt.

TVA's statutory debt ceiling of \$30 billion, established when TVA was planning 17 nuclear reactors, is well above that necessary for the current 9-reactor investment program.

Thus, this authorization runs the danger of abuse if TVA uses this excess borrowing authority to enable it to roll over its debt and avoid raising its rates to its power customers.

Such a debt rollover would add to the Federal deficit. These additions to the deficit are not inevitable. They are only potential problems. But the key point is that they depend only on decisions of the TVA Board of Directors; the U.S. Treasury and the FFB exercise no control over the retirement of maturing FFB debt or the refinancing of privately held debt.

Finally, it appears that there is inadequate oversight or, in terms you use, accountability, at TVA. Within the current \$30 billion cap, TVA enjoys virtually automatic approval of its borrowing requests without any of the credit reviews that would normally be applied in the private market.

This blank check policy leaves TVA vulnerable to judgmental errors that could ultimately result in the necessity of refinancing debt or seeking congressional assistance in restructuring it.

More vigorous review might have reined in TVA's original 17 nuclear generators, 8 of which have been canceled, or the purchase of 10 years' supply of nuclear fuel, which they now have down to 5, but this still compares unfavorably with the 1-year target of most firms in the utilities industry.

TVA's financial performance in recent years does not justify such a blank check relationship. By key financial ratios normally used in the investment community to judge the quality of new debt issues, TVA is well below the industry norm. Its fixed assets are being used much less efficiently than those in the utility industry as a whole.

As I mentioned, its ratio of earnings to interest charges was only 0.7 in 1984, compared with a range of 2.0 to 3.5 for public utilities generally. Its ratio of fixed charges to revenues, a measure of efficiency with which it employs its capital stock, is nearly three times the industry average.

All these ratios indicate that TVA is operating under conditions that put upward pressure on its rates and jeopardize its ability to repay debt as it comes due.

In terms of FFB financing arrangements, however, there are several opportunities for improvement. Interest rates on new borrowings from the FFB by TVA could be calculated on the same basis as those that apply to Bonneville Power Administration, eliminating a large part of the implicit subsidy.

TVA's maturing debt should be repaid to the FFB as it comes due, and TVA should be discouraged from refinancing its privately-held debt with additional borrowings from the FFB.

TVA should be encouraged to continue its policy of financing an increasing share of its capital investment with revenue.

There are several other measures that might strengthen TVA's ability to repay its debt.

TVA's financial plans should be subject to an increasing level of oversight and review. Although there are no specific administration proposals at this time, it may also be appropriate to increase financial reviews of other FFB lending.

In light of the substantial reduction in TVA's expected capital investment, Congress might wish to reduce TVA's statutory debt ceiling of \$30 billion.

The Grace Commission recommendations to reduce construction and operating costs should be vigorously pursued. Finally, TVA's internal audit review staff could be strengthened through the establishment of a formal inspector general function.

In summary, I have attempted to provide the subcommittee with an analysis of the issues related to FFB financing of the TVA Power Program. Several of these issues are unique to TVA and its current banking relationship with the FFB.

Others are systemic to general FFB practices.

I have also attempted to point out areas where these financial relationships can be strengthened so as to provide greater financial discipline over TVA.

This would reduce Federal exposure that TVA actions might add to the Federal budget deficit.

Although I may have been critical of certain aspects of TVA financing practices, I want to emphasize to the subcommittee that TVA and FFB financial practices are all consistent with current law.

In several areas, for example, putting the off-budget FFB loans to the Seven States Energy Corp. and other borrowers into the budget, the administration has made proposals for changes to current law and policy.

In other areas, such as FFB interest rates charged to the TVA, the administration has not proposed specific changes. Some of these other changes would be controversial, I am sure. Nonetheless, I believe these ideas merit a more detailed review by the subcommittee.

Thank you for this opportunity to meet with you today, and I will do my best to respond to any questions you may have.

Senator HUMPHREY. Thank you, Ms. Eickhoff.

Is the administration making a proposal to lower the credit cap available to TVA?

Ms. EICKHOFF. No, not at this time.

Senator HUMPHREY. Is it anticipating or considering such a proposal?

Ms. EICKHOFF. Not that I am aware of.

Senator HUMPHREY. Whose responsibility would it be to entertain and make such a proposal, if it were in order?

Ms. EICKHOFF. We would think that it could be done either by OMB or by the Congress or by TVA.

Senator HUMPHREY. Is that something you are going to explore in greater depth?

Ms. EICKHOFF. It will be, I am sure, discussed further in OMB as we move into the next round of budget activities.

Senator HUMPHREY. You have suggested that areas for potential improvements include reducing the statutory debt ceiling of \$30 billion. That is one of the explicit potential improvements that you have listed here. So I would assume that OMB is interested in pursuing that a little further.

Is that a reasonable assumption?

Ms. EICKHOFF. I believe so.

Senator HUMPHREY. The \$30 billion limit was originally set by whom, by the way? Who has the responsibility for setting that limit?

Ms. EICKHOFF. I believe that was a limit changed by Congress.

Senator HUMPHREY. That is a statutory limit. In any event, that was set anticipating the construction of some 17 plants, nearly all of which have been canceled. So there would seem to be some rationale for taking another look at the level at which that ceiling is presently set.

This question of subsidy is a contentious question, and frankly, I think there are bigger issues here than subsidy. But I would like to get it straight in my mind, because everyone tells us something different.

You say OMB, in its official statement here today says, that TVA has been receiving a subsidy as a result of its ability to, in effect, borrow from the Federal Financing Bank.

Yet the proponents, the Board of Directors and others, say, "Yes, that is true, and that is certainly an advantage, but we pay one-eighth above the Treasury's cost."

How do you respond to that?

Ms. EICKHOFF. One-eighth above Treasury cost does not represent the market premium that would be paid were TVA in the marketplace.

Senator HUMPHREY. That is true. I would acknowledge that.

Ms. EICKHOFF. That is where the subsidy basically comes in. It is not a subsidy that is directly an out-of-pocket expense paid by the Federal Government.

More accurately, it is paid by other borrowers in the marketplace who are pushed down the queue because of TVA's presence in the Government hierarchy.

Senator HUMPHREY. In other words, theoretically, there is some marginal increase in general interest rates by virtue of the Treasury borrowing on behalf of TVA, and that marginal increase in interest rates raises the cost of borrowing to Treasury for all of its borrowers; is that correct?

Ms. EICKHOFF. That is correct.

Senator HUMPHREY. That is impossible to measure, but theoretically, that seems logical.

Ms. EICKHOFF. There is also an additional cost to the borrowers in the private sector.

Senator HUMPHREY. Yes, indeed.

Ms. EICKHOFF. They are not able to get as low rates as they would have were TVA not there.

Senator HUMPHREY. Right.

What about this one-eighth? Apart from what you have just said, and I think everyone would have to agree with that, is it correct to say that the one-eighth point premium which TVA pays covers, or more than covers, the Treasury's cost of borrowing on that particular issue?

Ms. EICKHOFF. I suspect that would be true, but the question I would ask is why do we treat Bonneville one way and say that they must pay a market equivalent rate, and we treat TVA a different way?

Senator HUMPHREY. You don't expect consistency from Congress, do you?

It depends upon where the votes are. That is the explanation.

So Bonneville and other power marketing associations pay what you call a market rate. Is that what you said?

Ms. EICKHOFF. Bonneville pays a rate that is "a market equivalent rate."

Senator HUMPHREY. A market equivalent rate.

Ms. EICKHOFF. One which the Treasury specifies; in fact, a premium over Government borrowing rates that would bring them to what they estimate the market rate would have been. It is not necessarily a true AAA utility rate or an AA utility. There is a judgmental element in there of trying to equate where the Bonneville-type company would fall.

Senator HUMPHREY. Are you saying that this market equivalent rate which Bonneville and others pay is what they would have to pay if they floated bonds in the private market? Is that it?

Ms. EICKHOFF. That is the essence of the legislation, as I understand it.

Senator HUMPHREY. What is the advantage? If Congress went that far, why didn't Congress just say, "Sell your bonds on the open market?"

Ms. EICKHOFF. Because at the time they established the FFB they wished to bring in all of the Federal financing into one place so that you didn't have various small issues going to market, sometimes at inordinately high premiums over what agency should have been paid, and an increased cost to the Government.

This Bonneville Power Administration reform came after the decision to put agency financing through the FFB, and at that time the decision was made to keep the efficiencies of the ability to borrow on the Government's good faith and credit, but yet not to have that benefit given out to simply the power customers of the utility, but to have it, in effect, distributed over the whole taxpayer base by bringing that revenue into the Federal Government.

Senator HUMPHREY. Senator Burdick.

Senator BURDICK. Mr. Chairman.

Welcome to the committee, Ms. Eickhoff. I am pleased to have your testimony this morning.

How often does OMB testify on oversights?

Ms. EICKHOFF. I have no idea but I would be happy to find out for you.

Senator BURDICK. It is rather unusual to have you here.

Ms. EICKHOFF. Yes.

Senator BURDICK. We welcome you.

Ms. EICKHOFF. Thank you.

Senator BURDICK. In testimony before the House Interior Committee, on March 7, 1985, David Stockman used TVA as his principal example of a Federal hydropower agency that operates without an interest rate subsidy on the outstanding Federal investment, as well as repaying the debt, according to a fixed amortization schedule.

How does TVA's repayment compare to other power programs, such as Bonneville?

Ms. EICKHOFF. Certainly, the appropriations debt is on schedule. Originally, they had \$1 billion investment, which they have paid off \$410 million of, and that was augmented by an additional appropriation debt of \$258 million. So they have a balance of \$848.

We can obtain the information for you on what repayments by Bonneville and other power authorities have been.

Senator BURDICK. That would be very helpful to have a side-by-side comparison on this.

Ms. EICKHOFF. We will prepare it for you.

[The information requested follows:]

I. OVERVIEW AND KEY POINTS

- o Over the past 50 years, the Federal government has built a large electrical power complex overseen by Bonneville Power and four other regional Power Marketing Administrations (PMA's).
 - o Electrical power is generated at 123 Federal dams.
 - o Electricity is delivered over 31,000 miles of high voltage transmission lines.
 - o Sales are 131 billion kilowatt-hours, 6 percent of the total U.S. supply.
 - o Two of the Federal PMA's (Bonneville and Western) are among the largest utilities in the country.
- o This power complex was financed with a massive amount of Federal debt. At present, the PMA's owe the Federal taxpayers \$12 billion, the equivalent of 80 percent of all bonds sold by corporations in the U.S. in 1983.

Power Marketing Administration	Federal Investment as of 9/30/84 - \$ Millions	
	Total Amount Repaid	Unpaid Balance
Bonneville.....	8,666	8,028
Western Area.....	3,957	2,430
Southeastern.....	1,043	747
Southwestern.....	751	687
Alaska.....	126	109
Total.....	14,543	12,001

- o The stated policy is, and always has been, that the PMA's be operated on sound business principles with full and timely recovery of interest and principal. In short, no taxpayer subsidy.
 - o "Rate schedules shall be drawn having regard to the recovery . . . of the cost of producing and transmitting such electric energy, including the amortization of the capital investment over a reasonable number of years."
 - o Bonneville Project Act, 1937

- o "We did not ask for this dam [Bonneville Dam] as a gift; we asked it as an economic asset. We propose to pay for it and should pay for it. The Government has no right to go to these favorite localities and build dams and give them to the people. We expect to pay for them as we should."
- o Oregon Governor Charles A. Martin, hearings before the House Committee on Rivers and Harbors, 1937.
- o In fact, in the early years, there were claims that the returns to the Federal taxpayer from power development of the Columbia River Basin would greatly exceed costs and help to reduce the Federal debt.
- o "At a time when the United States is staggering under the greatest debt it has ever known, here is the land and resources which, when developed, will contribute in a large measure to relieving this burden of debt by adding new wealth, new revenues, new taxes, and ideal homes for 10,000,000 more of our people. This proposed development is not an extravagance but an economy--a safe and sane investment which will return a thousandfold."
- o Honorable Compton I. White, Chairman, House Committee on Irrigation and Reclamation, 1943 hearings on Columbia River development.
- o In contrast to this simple stated policy, the present system of debt repayment is a complex, "jerry-built" system, full of special exceptions, gimmicks and novel accounting practices developed over the years, that is the antithesis of sound business principles and loaded with hidden taxpayer subsidies.
- o This radical departure from the original stated policy and the resulting accumulation of taxpayer subsidies to the PMA's has been obscured by a beguiling but fundamentally misleading claim: namely, that the PMA debt is like a fixed rate, low-interest mortgage entered into in good faith decades ago and that the PMA borrowers have a spotless record of meeting payments on a full and timely basis. Nothing could be further from the truth.
- o As a consequence, the outstanding PMA debt of \$12 billion has become a huge drain on the Federal budget that must now be "refinanced" under terms and conditions that are fair to the taxpayers, and far less burdensome to the budget.

Senator BURDICK. I might also send you some additional questions that I won't have time to present at this time.

Ms. EICKHOFF. We would be happy to answer them.

Senator BURDICK. Has OMB calculated what effect the elimination of the present interest rate advantage might have on TVA's power rates in the future?

Ms. EICKHOFF. At the present time, they are running at a \$1.3 billion subsidy that we would calculate.

I don't know what this translates to, though, in terms of the rates. TVA's rates generally run significantly under the power rates charged by other utility companies. So I would assume it would bring them up somewhat closer to the industry average.

Senator BURDICK. When you say subsidy, you are talking about the fact that their rates are lower and that the borrowing is cheaper?

Ms. EICKHOFF. Yes.

Senator BURDICK. That is what you are saying.

Ms. EICKHOFF. Because their borrowing costs are cheaper, it is possible for them to charge a lower rate to their customers.

Senator BURDICK. You are not trying to say that they are in default in any of their obligations or anything like that?

Ms. EICKHOFF. No, sir.

Senator BURDICK. With permission, I will supply you with some more questions, and I want to thank you for your testimony.

Senator HUMPHREY. Going back to your abbreviated statement, and of course your full statement will be included in the record, as well, in item 3 of the issues which you see as involved, you say that there has been insufficient oversight of the TVA Power Program. Insufficient oversight by whom, in the eyes of OMB?

Ms. EICKHOFF. Almost by anyone. The mechanism really doesn't seem to quite exist.

There is an internal audit function, but that doesn't quite have the same sort of outside look at the agency that you would really think of as oversight, although it has apparently a good internal audit department.

FFB asks no questions whatsoever. If you have got the authority to borrow, they write the checks.

Senator HUMPHREY. I would like to find a bank like that.

Ms. EICKHOFF. Yes. I would, too.

Senator HUMPHREY. That is a pretty good deal.

Ms. EICKHOFF. OMB looks at it primarily when questions of raising the debt ceiling arise. Otherwise, the information we receive is on an information only basis, not for us to oversee.

GAO does oversee them on a once-in-3-year basis. That doesn't seem to be enough.

Senator HUMPHREY. Who does that review?

Ms. EICKHOFF. GAO.

That seems a little infrequent to me for the biggest power company in the United States, considering its financial ratios are all well below what one would think that they ought to be.

Senator HUMPHREY. Yes. What sort of audit does GAO accomplish every 3 years? Is it just to make sure that the figures all add up correctly, or is there some judgment about management decisions and improvements and so on?

Ms. EICKHOFF. It is what is termed as a general managerial audit. I do not personally know what is involved.

Senator HUMPHREY. Does your staff know the answer to that?

Ms. EICKHOFF. We would be happy to give you a written answer to the question.

Senator HUMPHREY. OK. That is important.

BY THE COMPTROLLER GENERAL

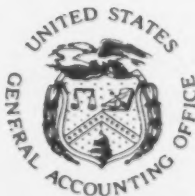
Report To The Congress

OF THE UNITED STATES

Triennial Assessment Of The Tennessee Valley Authority--Fiscal Years 1980-1982

This report summarizes GAO's work at the Tennessee Valley Authority (TVA) during the past 3 years. Because TVA is a Federal corporation, GAO is required to report on TVA's status every 3 years. The report presents the progress TVA has made to comply with GAO's recommendations dealing with demand forecasting, internal audit, and acquisition of ADP resources. It also discusses information and data on TVA requested by the Congress. Overall, TVA has taken a positive approach in implementing many of GAO's recommendations and is making progress in improving its operations.

[Note: This report, furnished in accordance with Senator Humphrey's request for additional information, has been retained in committee files.]



GAO/RCED-83-123
APRIL 15, 1983

Senator HUMPHREY. You note that the TVA borrowings through FFB have not yet come due but will begin soon and you say in your statement that there is concern. To quote,

... lead to concern that TVA may seek to roll over its FFB obligations instead of paying them off.

Concern on the part of who?

Ms. EICKHOFF. On the part of OMB.

Senator HUMPHREY. What is the nature of that concern?

Ms. EICKHOFF. The nature is that particularly with the changes in the numbers that they have presented to us beginning in January of 1984 and continuing until April of this year. The January 1984 numbers would appear to be consistent with TVA making repayment on the debt. Since then, their borrowing estimates have been increasing even though capital investment requirements for new nuclear projects were decreasing.

As a result, the April numbers do not appear to be consistent with the notion that TVA will repay its debt on the original schedule.

Senator HUMPHREY. So there has been, apparently, a policy change on that score about rolling over in the last 6 months?

Ms. EICKHOFF. We have no way of explicitly determining that until it is time for them to roll over.

Senator HUMPHREY. We won't know until they knock on the door with their hand out.

Ms. EICKHOFF. Right. But it looks as if the revenues have not been set at a high enough level to generate the income that would be required.

Senator HUMPHREY. What about the repayment schedule on the privately sold notes? Do you know anything about that? When are they coming due? Is that something that you know about?

Ms. EICKHOFF. November 1985 is when the first payment is due on the private notes.

Senator HUMPHREY. You don't know yet, apparently, whether TVA intends to pay down those notes or refinance private notes, pay off the private notes through borrowings from the FFB?

Ms. EICKHOFF. No. I am quite sure they will pay off the notes. They won't attempt to defer.

Senator HUMPHREY. How they get the money is the question.

Ms. EICKHOFF. Right.

Senator HUMPHREY. What do you think of current FFB practices relative to TVA? I mean, the whole general question of FFB practices is something that needs to be thoroughly discussed, but we only have jurisdiction here relative to TVA.

What do you think of FFB practices relative to TVA?

Ms. EICKHOFF. I am not sure that the problem is, per se, at the FFB. It was set up to perform a particular function, and it is doing that.

Senator HUMPHREY. In other words, the oversight should come before the application gets to FFB; it is not their fault. They are doing what they are supposed to?

Ms. EICKHOFF. I would think it should be a broader oversight that would be appropriate to FFB, perhaps even to have raised questions on the power program as that was going along. You wouldn't expect the FFB to inquire into those kinds of measures.

Senator HUMPHREY. In other words the FFB is really anticipated to be an open cash drawer and dole it out; it is anticipated under the law that oversight and review and scrutiny would come before that stage.

What about these other power agencies? Are they subject to that type of oversight and scrutiny; that before they get to the FFB, is there some judgment made about the prudence of the decisions?

Ms. EICKHOFF. They do not all go to the FFB. Bonneville goes directly to Treasury, which does not exercise oversight, but Bonneville and the other power marketing administrations are subject to closer review by OMB, for example, than TVA.

Senator HUMPHREY. They even cut out the middle man; that is pretty good.

What I am getting at, is, the concern here with respect to TVA is that they can come and borrow money when they want it in whatever amount they want up to the cap, and they are far from it. There is a huge line of credit. They can borrow whatever they want whenever they want in whatever amount they want for whatever they want, and nobody examines the proposal.

Ms. EICKHOFF. Within the \$30 billion cap, that is our interpretation, yes, sir.

Senator HUMPHREY. That gives the management of TVA enormous flexibility, enormous power for which they are accountable to no one, really, in any practical sense.

Ms. EICKHOFF. Correct.

Senator HUMPHREY. No one is accusing or has accused any individuals of wrong doing or deliberate exercise of poor judgment, but you know the old saying about power corrupting, and it is an insidious process. It is a subconscious process. When there is power with no check and no balance, then there is going to be corruption of one type or another, maybe not penal corruption, but mistakes that cost people a lot of money, in this case, the ratepayers of the TVA region.

Going further on in your testimony, you say,

More vigorous review might have reined in TVA's original plan for 17 nuclear generators, 8 of which have now been canceled, or their purchase of 10 years' worth of nuclear fuel * * *.

There is one of the mistakes that was made. Perhaps it would have been made anyway, but I suspect that the magnitude would have been much smaller, had there been some vigorous review, as you suggested.

Do you have any ideas on how that review should be conducted in the future so there is some outside discipline imposed on TVA in the way there is outside discipline imposed on every utility in the country?

Ms. EICKHOFF. We had thought that perhaps it might be possible to do it through an inspector general-type program, particularly if it was given some direction that certain types of things were to be regularly looked at.

Senator HUMPHREY. All right. Let's talk about that. That proposal has come up before these hearings, and it is not a new proposal, for that matter. It has been made in years past, TVA counters by saying, "Well, we have set up an independent Office of Operations and Inspection, an independent Office of Internal Audit."

Are you acquainted with the functioning of that office, and why does it exist?

Ms. EICKHOFF. I am familiar with the functioning of internal audit offices in major corporations on whose boards I have served. They perform a very useful function. But they require that you have independent outside directors to whom they report.

As I understand TVA, and I could be mistaken, while the Board is appointed by the President, it is really an operational board that is involved on a day-to-day basis with the ongoing activities of the company.

It is not an outside board of directors that is there to critique what management is doing. It becomes very quickly part of management. So I think that tends to undercut the Internal Audit Department, because if the Board has endorsed or undertaken operational decisions that internal audit might feel were inappropriate, they have no one to report to.

Senator HUMPHREY. Except those who can fire them.

Ms. EICKHOFF. Except, well, those who can fire them and critique their activities.

Senator HUMPHREY. What they would do is they would temper their criticism, knowing that they were not truly independent; knowing that the Board could show its displeasure by one means or another.

So you wouldn't get a truly objective, critical analysis under that arrangement, one would think.

Ms. EICKHOFF. Well, I would be concerned that that could happen, particularly at a time when a problem was occurring.

Senator HUMPHREY. I think we all know how human nature functions. We might not all be experts on TVA, and I am not, but I think all of us who have been around for a while know what this present arrangement is subject to. After all, these people know they are working for the Board of Directors, and they are not going to be as critical and as objective as they might have if they were a truly independent Office of Inspection.

The other Federal agencies—and we have to recall that TVA is a Federal agency, ironically. We will talk about the irony of that later on, but nevertheless, TVA is a Federal agency. Clearly, it is not a local agency or a State agency. It is a Federal agency. That is why we are overseeing it.

TVA is a Federal agency. Am I correct in saying that most Federal agencies have an independent Office of Inspector General?

Ms. EICKHOFF. That is correct, the major agencies have such offices.

Senator HUMPHREY. How is such an inspector general appointed? By whom?

Ms. EICKHOFF. The inspector general positions are Presidential appointments.

Senator HUMPHREY. Appointed by the President, and such inspectors general can be removed by whom?

Ms. EICKHOFF. They are serving at the pleasure of the President. He could remove them, I assume, at any point in time.

Senator HUMPHREY. We even have at the Pentagon, thank goodness, an inspector general, and he can't be removed by the Secretary of Defense, can he?

Ms. EICKHOFF. No.

Senator HUMPHREY. Or by any of the Service Secretaries. He can only be removed by the President. That person has true independence of the kind which is absent at TVA. Is that correct?

Ms. EICKHOFF. That is the intent, yes.

Senator HUMPHREY. I think that is one of the things that really jumps out at you. I am not prepared to recommend proposals in advance of having had all of these hearings and giving everyone a chance to testify, but that is one that really jumps out at you when the demands, it seems to me, are formed.

Senator BURDICK?

Senator BURDICK. Ms. Eickhoff, I didn't hear clearly what you said about their nuclear programs. Do you want to repeat what you said about the TVA's nuclear programs?

Ms. EICKHOFF. The original establishment of 17 nuclear programs, which proved to be far in excess of what the demand in the region would support, had to be cut back by eight, and at the same time, they build up fuel inventories to a 10-year supply on hand in contrast to an industry practice of a 1-year supply. Now they have cut back the number of powerplants and reduced their inventory to a five years' supply.

But it makes one wonder that, if there had been more questions being asked, if these things might not have been discovered much sooner than they were. TVA is not the only utility that started constructing too much nuclear power capacity.

Senator BURDICK. I was coming to that.

Ms. EICKHOFF. Not by any means. But I think TVA might well be the one which began constructing the most excess capacity. But I would have to check that out further in the utility systems.

Senator BURDICK. I happen to know something about this personally, having been an investor, and I know that nuclear plants all over the country, even New England, have had trouble. So this isn't peculiar to TVA.

Ms. EICKHOFF. I think the peculiarity, though, is that in this case, it is the U.S. taxpayer who ultimately bears the burden. In the others, it is the shareholders in the companies.

Senator BURDICK. I know. Except that it is a managerial factor; others have made the same error. That is the point I am making.

Ms. EICKHOFF. Yes.

Senator HUMPHREY. Would the Senator permit me to interrupt here for just a minute?

Senator BURDICK. Sure.

Senator HUMPHREY. It seems to me that there was a misstatement of the situation, not deliberate, I am sure. But you said that

the taxpayers ultimately bear the burden in the case of TVA's mistakes.

That isn't the way I see it. The power program is now self-financing. To be sure, some of the money it borrows, it is money which has to be repaid. Repaid by whom? The ratepayers of the TVA region.

So it isn't the taxpayers of the United States who pay for TVA's mistakes, which are engendered by the management structure, lacking accountability completely. It is the ratepayers of the valley who pay for TVA's mistakes, and they haven't begun to see the rate increases that are going to come forth. They are being masked, they are being hidden, because TVA is hiding those mistakes by borrowing money and not paying it back. Ultimately, the people of the valley and not the taxpayers bear the burden. I am certain you see it that way.

Ms. EICKHOFF. I certainly agree with you in one sense. But if you ask the question one step further, what if it is not possible—

Senator HUMPHREY. Do not say it.

Ms. EICKHOFF [continuing]. To get that money from the ratepayers in the valley, then it is the taxpayer who is at risk.

Senator HUMPHREY. Ultimate liability, yes.

Ms. EICKHOFF. Yes.

Senator HUMPHREY. Sorry. Thank you for yielding.

Senator BURDICK. I know there is some bad judgment both in the private industry and in this area, too. There is no question about that. I won't give you the name of the stock. With the privilege of submitting written questions, I think that will be it.

Ms. EICKHOFF. Fine.

Senator HUMPHREY. Thank you, Ms. Eickhoff. You were very helpful.

Senator BURDICK. I would like to ask permission to have the TVA make a reply at the proper time to this testimony.

Senator HUMPHREY. Fine. If it is agreeable with you, Senator, we will leave the record open for a week for supplemental statements of other parties who wish to be included in today's record.

Let us ask now for our next panel of witnesses to come up to the table, Dr. William Chandler, senior researcher at Worldwatch Institute, and Dr. Richard Cuoto, senior research associate at Vanderbilt Institute for Public Policy Studies in Nashville.

Good morning. We thank you for your patience.

In order of the printed agenda, let's ask Dr. Chandler to present his statement first.

STATEMENT OF DR. WILLIAM CHANDLER, SENIOR RESEARCHER, WORLDWATCH INSTITUTE, WASHINGTON, DC

Mr. CHANDLER. Thank you, Senator. I appreciate the opportunity. I would like to emphasize that I am speaking more as a native of the Tennessee Valley than as a representative of the Worldwatch Institute today.

Senator HUMPHREY. All right.

Mr. CHANDLER. The Tennessee Valley Authority is currently the subject of two debates, the first being the debate on TVA's Power

Program, which I find unique in the organization's 52-year history. For the first time, the issue is not public versus private power. It is this issue of accountability to the people that it serves.

Senator HUMPHREY. I am glad you are making that point. Pardon me for interrupting, but that is, indeed, our focus, accountability, not the issue of whether TVA is there or should be there. It is there, and how do we deal with it? That is the responsibility we face.

Mr. CHANDLER. The concurrent debate on TVA's nonpower budget, on the proposed cuts in those budgets has elicited an emotional response, I think probably because it represents the last vestige of TVA's regional economic development program.

If you examine those programs, you find controversial and destructive construction projects, as well as popular natural and human resource programs. I personally believe that neither blind budget cutting nor blind defense of TVA as it is will serve the interests of the people in the Tennessee Valley. A more constructive debate would weigh unemotionally the costs and benefits of TVA and use these to evaluate the key question, which I think is accountability.

TVA has been an experiment and it has tested primarily this unique governmental arrangement. It has tested the merits of technocracy, which is this idea of placing resources in the hands of experts who are free and flexible to do with them what they will.

Secondarily, it has tested the strategy of investing in cheap electric power and water transportation as the primary engines of economic development.

Any evaluation of TVA or TVA's future has to revolve around these two basic questions. The first is, who owns and benefits from TVA; and the second is, how well has this unique experiment worked?

The question of TVA's future has been decided, to a large degree, by the facts of its past. The most important of these is that TVA has become overwhelmingly an electric utility. Electric power has, since the 1940's, been TVA's main product. Today, over 97 percent of TVA's budget goes to electric power.

The power budget has 10 more times economic impact on the regions economy than the economic programs. For example, when TVA raises its rates simply by 2 percent, it takes more money out of the valley than all the appropriated programs together put into the valley.

Let me focus first on TVA's electric power programs. TVA is owned by the Federal Government, and as you pointed out, the TVA Act was amended in 1959 to require the users of TVA electricity to bear all the costs of investment. TVA consumers are thus required by law to pay their own way. This is an extraordinary deal for the Federal Government, because it owns and controls the largest utility in the country, but by law, accepts no financial risks for it.

Conversely, it is a bad deal for the valley residents to bear all of the risks but none of the decisionmaking authority. All decisions with respect to powerplant construction and rates are determined by the Federal Government's TVA Board.

Decisions TVA has made since the 1959 amendments to the TVA Act have profoundly affected the region. While the coal-fired plants have been among the most efficient in the Nation, TVA's overconstruction and mismanagement of nuclear powerplants has had a serious impact, wasting over \$5 billion. TVA promoted electric power consumption to the extent that consumption is 50 percent more than the national average for the average residence.

Even though rates are relatively low, the average annual residential electric bill in the service area is slightly higher than the national average. The basic cause of these problems has been the lack of checks and balances; that is, the absence of State or regional oversight and regulation of power forecasting and powerplant construction.

TVA does now make its forecasts available for review and comment, which is an important reform. But it has to be noted that the ability to comment on a plan and real power to change it through the democratic process are two very different things.

Turning to TVA's role in economic development, TVA, almost from the very beginning, chose a strategy of providing cheap power and water transportation to promote economic growth. Interestingly, it is difficult to find quantitative evidence that this strategy accelerated economic growth in the region. Per capita income growth in surrounding non-TVA areas equaled or exceeded that in the TVA region, even where they were just as poor at the beginning of the TVA experiment.

Rural electrification, suprisingly, progressed more slowly in the Tennessee Valley region than in comparable surrounding areas. These facts call into question both the strategy of investing primarily in electric power and water transportation as a basis of economic growth and in the system of government that TVA represents.

Using TVA's own estimates of the economic return on its investment in the flood control and water transportation systems, it is clear that they were poor uses of funds. Flood control and navigation investments failed to break even in economic benefits for more than 40 years after they were initiated.

TVA has also made many contributions to the region, as well as the Nation. TVA programs to demonstrate the use of fertilizers, crop rotation, and soil conservation serve as models for large scale Government sponsored education programs. TVA taught farmers how to use unfamiliar but scientifically proven agricultural methods, and those altered farmers' perceptions of risks and made it easier for them to risk their livelihoods in using them to improve their productivity. Since there is still strong need for soil erosion control in the valley, it is commendable that TVA has led efforts in no till farming.

Similarly, the TVA and National Fertilizer Development Center claims responsibility for many breakthroughs in fertilizer production, including what they refer to as the basic processes used to make three of today's most important fertilizers. These programs have helped to increase the growth of incomes through agricultural development, not just across the Southeast, but across the Nation.

The TVA's recent capital projects for regional development have been flawed. This has been illustrated by the Tellico Dam experience. TVA created Tellico, in part, for the energy it provides,

which amounted to 22 megawatts, at the same time they were canceling over 5,000 megawatts of power. TVA insisted it needed twice as much land as was to be flooded for the reservoir for industrial development, and they promised something like 40,000 jobs.

Now, 5 years after completion, only about 100 jobs have been provided, and none of these came about as a result of having the reservoir. For this, TVA condemned the land of farmers such as Jean Ritchey, who along with her husband, lost about 100 acres, only 2 of which were to be flooded by the reservoir. These people now rent back from TVA the land that was theirs.

Tellico damaged TVA's reputation and was a loss for all. The unbelievable thing about Tellico is that TVA will probably repeat that experience; that experience will probably be repeated on the Duck River in middle Tennessee with the Columbia Dam project. This project was earlier rejected by TVA because it was considered uneconomic. The dam would provide no hydroelectric potential, no navigational benefits, and only minor flood control. Most of the benefits would be recreational.

Senator HUMPHREY. May I interrupt to ask about that point, because I really don't have the facts on the situation. Why is it necessary to complete the Columbia Dam in order to attract this new industry, whose location has just been announced?

Mr. CHANDLER. I spoke with General Motors yesterday about that, and the public relations officer stated to me that he had no idea that there was a dam being constructed there until I mentioned it to him. So I don't think there is any need for that project.

Senator HUMPHREY. The facility is to be built on land already acquired by TVA, I assume.

Mr. CHANDLER. I am not familiar with the location issue.

Senator HUMPHREY. I am just wondering why it is necessary to build an automobile plant where a dam is going to be constructed. Are you going to use water-powered paddle wheels; entice the employees to take a dip?

Mr. CHANDLER. New York offered the project a billion dollars' worth of free electricity, and that wasn't enough to attract them. I think there was something else, such as location, access to markets, the labor force, attitudes toward unions, transportation.

Senator HUMPHREY. Not by the building of a dam.

Mr. CHANDLER. That is correct.

Senator HUMPHREY. That is very perplexing to me. I don't have all the facts on it yet, so I don't mean to be judgmental.

Mr. CHANDLER. The idea that this project might be completed for political reasons, I think, undercuts TVA's claim of flexibility and independence.

Senator HUMPHREY. Excuse me for the interruption. Go ahead.

Mr. CHANDLER. Let me turn to TVA and the environment.

The Federal presence in the valley has left a legacy of environmental problems, such as coal strip mining, acid rain, deoxygenated water in the reservoirs. These are problems which TVA both directly and indirectly contributed to. The problems were made far worse during the forties and fifties, by the fact that TVA supplied more than half of its power for weapons fabrication and uranium enrichment to the Federal Government. Not only was the Federal Government in part responsible for this land, water, and air degra-

dation by its dam building and coal procurement policies, but it also caused these problems in the course of supplying power for national security programs. It is natural, then, that valley citizens would jealously guard the small sums of money that are appropriated for TVA's natural resource problems to help mitigate some of these problems.

Let me just conclude by talking a little bit more about accountability, which is a key feature of the American system and is essential both in the marketplace and in Government. When a company like Coca-Cola makes a mistake, it has to face the market, and a correction is forced. When politicians make mistakes, they have to face that day of reckoning when they stand up before the electorate and explain why they voted as they did. But TVA is not accountable to the marketplace, because it is a monopoly. It is not accountable to the electorate, because its directors do not owe their jobs to the people that they serve. Neither do the politicians who appoint the directors. The directors are appointed for 9-year terms by a President who may or may not understand the problems of the valley, and their appointments are reviewed by a Senate committee, which at present doesn't even include a representative of the valley.

So in looking at the range of options for making TVA accountable, you might find that the range is fairly small.

With regard to the utility portion, they include first, retaining control of TVA by the Federal Government with, however, the Federal Government assuming the normal financial risks of ownership, including the costs incurred with powerplant overconstruction and mismanagement.

Second, ownership of TVA should be transferred to a valley-based cooperative owned by the TVA ratepayers with State or regional regulation of design and construction permitted.

Third, the status quo. The status quo could be maintained, but with regional or State regulation of the power.

The most important option for the appropriated programs includes retaining them, I think, but at the same time requiring congressional authorization for all appropriations.

With these few changes in the charter, I think TVA could continue to serve the valley well.

Senator HUMPHREY. Thank you, Dr. Chandler.

Dr. Cuoto.

STATEMENT OF DR. RICHARD CUOTO, SENIOR RESEARCH ASSOCIATE, VANDERBILT INSTITUTE FOR PUBLIC POLICY STUDIES, NASHVILLE, TN

Dr. CUOTO. Mr. Chairman, members of the committee, I am very grateful for the invitation to testify today, and I welcome the opportunity to speak about TVA.

I speak as a student and researcher on TVA; also as a ratepayer, and in some ways, as a colleague of TVA and some of the economic and human service programs.

TVA embodies a unique set of American and political beliefs that came together at a time of the New Deal. In any discussion of TVA, I think it is important to differentiate those continued serv-

ices surrounding its principles and those continued services surrounding its practices.

My written testimony reviews the principles of government that TVA embodies and reviews also the practices of TVA in the recent past.

I would like to abridge my written testimony and speak from it in the interest of time.

The principles of TVA are in vogue and popular, somewhat anathema at some times, and unpopular at other times. In this sense, TVA serves as a reflection of American and political attitudes. TVA has adjusted its practices from time to time to adjust to the needs of its friends and to its foes, and to change emphasis in American political attitudes.

At all times, however, TVA reflects back to the American people an image of themselves and who they think they ought to be. In recent years, that image has been tarnished by the practice of TVA and has been satisfactory to very few people. Even this tarnished image of TVA is a reflection of what we, or some of us, wanted.

TVA pursued some of its practices for which it is criticized today, precisely because it was encouraged to do so by elements of Congress. TVA's accountability to its friends and to its critics in Congress explain some of its poor successes, including recent unjustified and unwarranted water projects.

TVA worked hard within the forms of accountability that it had to prove to its friends that it would continue yesterday's practice and to its critics that it was not working for a radical new tomorrow. The real tragedy of the recent TVA is that it clung to yesterday's promise of cheap and abundant electrical power until it became an anachronism which needed radical adjustment to today's realities.

TVA has worked hard since 1977 to establish better forms of accountability and new policies which are more sound in environmental and social terms. TVA represents one of the most profound reforms of a Government agency in recent time. It has established new policies of conservation that enable all consumers to save money by using less electrical power. It has instituted sounder policies through all phases of the coal cycle. Most notably, it has cleaned up its emissions. It has reformed its rate structure to give consumers incentives to conserve, and it has still preserved its original mandate to give residential customers a preference in rates.

In the midst of all these changes, TVA has created new forms of accountability. TVA instituted open meetings. It conducted its board meetings around the valley. It instituted a toll-free phone number for residents of the valley. It conducted seminars and programs for civic groups in the valley, and also, most importantly, it brought groups which it had previously excluded into its discussions on policy.

The point is that in the past 8 years, TVA has responded to past criticisms, it has instituted reform of past practices, and it has increased its forms and practices of accountability.

More needs to be done. There is no question about that. But we should not overlook a good beginning. I think it is better to look at

changes that would involve large numbers of people and more diverse interests in TVA's policies rather than changes in a handful of officials at the top. I believe the new realities of energy production and use are not adequately reflected in TVA at the grassroots.

TVA needs change at the bottom, the grassroots, the municipal distributors and rural cooperatives.

But to focus exclusively on changes in the power program would be to reinforce the most serious division of TVA's practice from its principles. TVA is not only a power program. It is an experiment in regional development. Human resource development has not been a major agenda item of TVA, and it should be. TVA is in a region with significant amounts of rural poverty and all the accompanying statistics of deprivation that mock American attitudes of quality of life. Low income, unemployment, hunger, low levels of educational attainment, high rates of infant mortality, illiteracy, lack of access to health care, and substandard housing are all at intolerably high levels and impact too many people.

In light of these comments, I suggest the following action: TVA should act to assure that members of diverse interest groups, residential customers, environmentalists, and conservationists are appointed to the boards of the municipal distributors.

TVA should encourage rural cooperatives to locate and encourage members of these groups to run for membership on local boards and require that all rural cooperatives enact policies to expand participation in the election of board members.

Second, Congress should continue appropriations for TVA's non-power programs on the condition that TVA provide leadership and deal with problems of the rural poor.

Congress needs to demand of TVA that it create new forms of partnership of local leadership to initiate projects which can be disseminated at home and abroad. These national demonstration projects need to go beyond the easy and dubious answer of water projects and electrical power and deal with the difficult but component questions of the development of human resources.

Thank you.

Senator HUMPHREY. Thank you, Dr. Cuoto.

I want to thank both of you, as well as other witnesses who have submitted testimony beforehand so that we may read it prior to the hearing.

I have some questions about your testimony. First, let me say parenthetically, that I intend, in the future, to get into the appropriate programs, but that is not what we are doing now.

Dr. Chandler, you make the point that there is a misconception about TVA, that many view TVA as some kind of Federal giveaway.

You say that since 1959 the power program has been paid for by the citizens of the Tennessee Valley, and that ironically, the title, if you will, to this property which has been purchased by the people of the valley still resides in the Federal Government.

I can't contest you on that, it is certainly factually correct, it puts in that perspective and certainly gives it a wholly different appearance. I think your testimony on that point has been very useful, and the fact that when TVA raises its rates, as all utilities must, it reflects the general rate of inflation in that business.

But in the case where mistakes are made by an even greater amount, that that takes more money out of the region that is contributed by the nonpower appropriated programs.

So, what did they finally announce as their proposal for this fall's rate increase, 6.8 percent?

If, in fact, that increase is implemented, that increase will take more money out of the region's economy than any of the proposed reductions in appropriated programs. Is that correct?

Mr. CHANDLER. That is correct. It is clear that if you put money into a bad investment, such as powerplants that are not necessary, then that causes an opportunity cost which reduces economic growth in the region.

Senator HUMPHREY. Do you have any way of calculating or estimating what part of that proposed 6.8 rate increase is attributable to the mistakes TVA made? Do you have any idea?

Mr. CHANDLER. You would have to do a detailed analysis, but I have seen internal TVA analyses over the last few years that attributed most of the doubling in rates in real terms after inflation since 1972 to the overestimate of the demand for new generating capacity and the overconstruction of powerplants.

I would have to assume that that, along with the cost of borrowing money, is what is responsible for this.

Senator HUMPHREY. So rates to residential customers doubled in real terms, you say?

Mr. CHANDLER. Since 1972, yes.

Senator HUMPHREY. How about for industrial customers?

Mr. CHANDLER. I assume about the same. I don't have the figure on hand.

Senator HUMPHREY. In your statement, there is a discussion of this relationship between the ratepayers and the Federal Government. You say that the ratepayers who are building and have built TVA, the power system, are treated as colonials, in effect. You say, all the ratepayers get out of this colonial type of arrangement is a small subsidy, amounting to less than 1 percent of power operations.

Do you view this arrangement at present as a colonialist kind of relationship?

Mr. CHANDLER. The term refers to what I saw in Africa this spring, the results of the kind of system where you have people who make the decisions about investments residing somewhere else and the people who bear the consequences of those investments and those decisions living separately from them.

So since the decisions are made here as to who will run TVA, and since the people who have to bear the consequences are there, I think that is a fair comparison.

Senator HUMPHREY. Yes; in that sense, TVA is a power colony of Washington; is that what you are saying?

Mr. CHANDLER. No, I would not say that. I would not say it was a colonial type.

Senator HUMPHREY. Why not say it? You are saying this is a colonial type of arrangement. The people out in the colony bear the consequences.

Mr. CHANDLER. We do a lot more things down there than make electric power.

Senator HUMPHREY. I understand that, but I mean with respect to the TVA Power Program. In my view, it might be called a feudal arrangement, to use an older example, where the serfs are out there arranging for the capital improvements. The lord is back here holding title to the property and not doing a darn thing to earn it.

Senator Burdick.

Senator BURDICK. Yes; I have questions. You say the rates in the TVA area have doubled since 1970. Is that in keeping with the rates in the industry generally?

Mr. CHANDLER. Across the country, the real increase in the electric rates, residential rates, was about a 30-percent increase.

So what happened was that TVA basically lost its advantage, most of the advantage that it had at the beginning of that period.

Senator BURDICK. One of the many conclusions of your book is that TVA has had a negative effect on the economic development of the Tennessee Valley because its structure is not responsive to local and State interests.

What changes would you make in that TVA structure and public participation process?

Mr. CHANDLER. I would recommend that ownership of TVA be transferred to the people who are paying for it, to the ratepayers, and that there be regulatory oversight, either on a State-by-State basis or on a regional basis such as Congress recently established for the Northwest, the regional power council that oversees BPA the Bonneville Power Administration.

Senator BURDICK. Are you telling me that the people of the TVA areas, however many states are involved, don't support the concept?

Mr. CHANDLER. I am sorry?

Senator BURDICK. Are you telling me the people of the TVA area don't support the concept of the TVA?

Mr. CHANDLER. I am not sure that is it.

Senator BURDICK. Are they for TVA? I will make it simple.

Mr. CHANDLER. I can't speak for them, because I am not an elected representative of the people, and I don't think anyone has conducted a poll. I know one of our newspapers conducted a survey, and it was 50-50. I don't know what that means. It wasn't a scientific survey.

Senator BURDICK. We will leave that to another witness.

When you evaluated the rate of the TVA investment, you looked at such functions as flood control and navigation, not the return on the system as a whole. Did you also look at the power and recreation functions? If not, why not? Why wasn't a total rate return computed on this TVA investment?

Mr. CHANDLER. I followed World Bank methodology here, which is to use a least-cost approach in looking at power projects, because it is difficult to say what the benefit of electric power is. Do you use the marginal value? Do you use the average value? Anyway, the question is complicated by the fact that you have alternative means of generating electric power.

So the way I addressed that question was to ask how well were the decisions made that TVA made in terms of choosing generation facilities. I found that at least a dozen of the large power dams

were not cost effective compared to available generating alternatives, even if you assume that they used low sulphur coal, which of course, they were not doing at the time.

So it is a question of management; it is a question of how well the decisions were made. That is what I was trying to get at, Did they make the right choices? And there were a dozen very large mistakes there.

Senator BURDICK. Did you compare the rate of return on the TVA investment with the return on the similar public works programs such as the Corps of Engineers or the Bureau of Reclamation?

Mr. CHANDLER. I have not done that, sir.

Senator BURDICK. Mr. Cuoto?

Dr. CUOTO. Right.

Senator BURDICK. In your statement, you say:

Congress should continue appropriations for TVA's nonpower programs on the condition that TVA provide leadership in dealing with problems of the rural poor.

That is right in the face of others who oppose TVA and want that function eliminated. Why do you come to that conclusion?

Dr. CUOTO. Because I think TVA was an experiment, and I think the experiment has not been concluded. I think the experiment is needed. I think rural poverty still needs it badly. It is a national problem, as well, and that TVA was conceptualized as a model, as an experiment, as a demonstration agency, and the question of development of human resources is one part of that experiment that never got full attention and, I think in terms of national issues and needs, requires attention. I think TVA could do the job.

Senator BURDICK. So you are testifying that TVA should not remain in power alone, but the other functions should be maintained?

Dr. CUOTO. That is right. I think at least one part of TVA is a regional development agency and that there are aspects of that mission that need renewed attention.

Senator BURDICK. Thank you very much.

That is all.

Senator HUMPHREY. Dr. Chandler, you talked of two elements of these nuclear power mistakes. The first is the overcommitment, and that has been pretty well aired.

Also, something that hasn't come up yet in any detail is the construction problems. Can you give us your thoughts about the wisdom of TVA undertaking to manage the construction itself with its own personnel and the general matter of problems that have been encountered by the construction operations?

Mr. CHANDLER. That is an interesting question. I am afraid I don't have a very satisfactory answer, but I am sure TVA looked at its earlier experience in building dams. Whether they chose the best projects or not is questionable, but the fact that they were efficient in constructing them certainly led them to believe that they could repeat the performance with coal-fired plants, which they did, pretty much.

With the nuclear systems, it is much more complicated. I suppose there is the problem of the complexity of the nuclear system itself, and there is also the question of the "brain drain" that

Chairman Dean mentions, the possibility that TVA cannot employ the best managers because of competition with people who are not restricted in how much they can pay.

There is also the question of the management structure itself. Some people suggest that TVA is a top-down sort of organization that doesn't listen well to its internal critics, sort of like General Motors has been criticized as being in the past, and so that TVA has possibly missed some chances for correcting mistakes.

Senator HUMPHREY. You are not in a position, then, to comment on whether TVA should continue to be involved in actual construction or not?

Mr. CHANDLER. I think that would take a lot of thought, and I am not prepared to say.

Senator HUMPHREY. All right.

You make the statement that TVA makes its forecasts available for public review and comment, which is an important review, I suppose, of the kind that Dr. Cuoto has supported. You say:

It must be noted, however, that the ability to comment on a plan and real power to change it through the democratic process are two very different things.

What do you mean by that? Why is the status quo not good enough?

Mr. CHANDLER. I was reading in the Economist recently a review of democracy around the world and an evaluation of where democracy has progressed and where it had not. The simple definition of democracy was, Can you change the Government? Can you change the policy?

I think in a system where people are going to be asked to pay for the costs of decisions, then they should have the right to say yes or no about those investments. That is just basic.

Senator HUMPHREY. Of course, they would like to have elected representatives to say yes or no.

Mr. CHANDLER. There has to be a link there somewhere.

Senator HUMPHREY. Presently, apart from all of the efforts of TVA to encourage public participation, the only way available to citizens to affect decisions is through the courts. Is that correct?

Mr. CHANDLER. Well, the courts have provided one means of enforcing Federal laws, which TVA at one point sought not to comply with.

The citizens have tried other means of influencing TVA policy, such as lobbying the President. They have met with less success there than they had wanted. In fact, at times, they were not permitted to meet with the personnel people to discuss whether their candidates or the candidates that would be chosen were the ones who should be running TVA.

So there are not very many avenues for changing TVA policy. You can come to this committee, when this committee holds oversight hearings every few years, but that is less than satisfactory, too.

Senator HUMPHREY. I agree.

What recourse will be available to those who oppose completing the Columbia Dam, which I understand has been called for in the last few days. Am I correct in that?

Mr. CHANDLER. There is a benefit-cost analysis being conducted by TVA, which, I suppose, represents a renewed interest here.

There is a procedure for public comment. There is a time period permitted for that. TVA has agreed to publish those comments and alternative benefit-cost analyses.

But in the end, that is very similar to the process of commenting on rates, which is that you can express an opinion, but if you don't agree with the decision, then you can't register your dissatisfaction through the electoral process.

Senator HUMPHREY. Yes; you cannot hold someone accountable, ultimately. There is no way you can hold anybody accountable after the fact.

Mr. CHANDLER. The nonpower programs are not authorized, and so there is less of the usual checks and balances with the TVA appropriated programs than you find in other agencies.

Senator HUMPHREY. What is the story behind the mothballing of the coal gasification plant on which over \$100 million was spent?

Mr. CHANDLER. The coal gasification plant is another interesting example of one of the capital projects that had been begun without adequate review.

The plant went through several design changes, and finally, when funds were no longer available through Congress or through the Synthetic Fuels Corporation, the operation had to be discontinued. I think the basic lesson of the coal gasification plant is that these demonstration programs need careful review, and this one did not receive careful review before it was initiated.

Senator HUMPHREY. Was it ever authorized by Congress?

Mr. CHANDLER. It was not.

Senator HUMPHREY. Part of the problem with respect to the appropriated programs is that there is no authorization process for those programs. If there is a political support within the Appropriations Committee, then those projects can be gotten underway without any authorization. Is that correct?

Mr. CHANDLER. I think checks and balances on appropriations is a procedure that we have to take seriously. I think authorization is an important part of that process.

Senator HUMPHREY. Senator Burdick?

Senator BURDICK. No further questions.

Senator HUMPHREY. Coming to the end of your testimony, you made some proposals that represent substantial reform, were they to be adopted.

I suppose the most unique, if not revolutionary of those proposals is the transferring of ownership of TVA to a valley-based cooperative owned by the TVA ratepayers with the directors either directly elected or the directors chosen by the corporate structure, with the utility regulated by the States.

Mr. CHANDLER. Can I comment on that?

I don't view that as revolutionary, simply because we do have co-ops operating all over the United States today owned by the consumer owners, and some of them are regulated by the States at this time.

Senator HUMPHREY. In that sense, yes, certainly, that is true.

What advantages would such a reform have for the people of the valley, as you see it?

Mr. CHANDLER. The shift of ownership would clean up the untidiness of this relationship, where you have the owner, the Federal Government, not taking any of the risk for the project, for the system.

The regulation of the system would provide, again, these checks and balances, the review by competent bodies to question multibillion-dollar decisions before they are sunk in concrete, and they do have value.

The question was raised earlier of the mistakes of private utilities, and certainly, private utilities have made mistakes around the country. But if you take the last 5 years of powerplant cancellations, the TVA capacity that has been canceled, if you measure it in terms of capacity canceled per kilowatt of installed capacity, it has been three times that of the national average. I have to attribute that, in part, to the benefit of having a system of controls.

Senator HUMPHREY. So you are saying that the benefit would be one of accountability.

Mr. CHANDLER. And lower rates.

Senator HUMPHREY. Less efficiency.

Mr. CHANDLER. And less environmental degradation through the production of unnecessary power. New England might benefit from that, as well.

Senator HUMPHREY. Greater sensitivity to local concerns? Is that what you are saying?

Mr. CHANDLER. I think local concerns is the key word there, local control.

Senator HUMPHREY. Greater sensitivity to local concerns of cost, of rates, and of environmental damage. That reform, if it were adopted, would represent the end of the colonial era. You declined to characterize it as that, but I will. If such a proposal were adopted, that would bring to an end the colonial era, error, take your pick.

It would take the title to this property and give it to those who paid for it through their monthly electric bill these past 25 or 26 years.

A value-based cooperative owned by TVA ratepayers. What is meant by that ownership? What would constitute that ownership? Would they have a certificate that indicates they own a piece of the rock, so to speak?

Mr. CHANDLER. Effectively, yes, in principle. The way co-ops work is each consumer has one share and one vote in the corporation and in the selection of the board of directors.

Senator HUMPHREY. Would that represent some real value? Would that represent some real property or what?

Mr. CHANDLER. It would not be negotiable. All benefits, all profits in co-ops are reinvested, are fed back into the corporation for the benefit of the corporation, of the co-op.

I would point out, too, that there has been dissatisfaction with co-ops. Many people feel that the simple mechanism of control of co-ops through the owners voting on the directors has not worked well, and in many areas, citizens groups are working to bring about additional regulation by the States of these cooperative utilities.

Senator HUMPHREY. Most, in fact, all but one of the distribution entities are co-ops, are they not?

Mr. CHANDLER. That is correct.

Senator HUMPHREY. What is that organization called?

Dr. CUOTO. Tennessee Valley Public Power Association.

Senator HUMPHREY. Tennessee Valley Public Power Association. All but one are co-ops; is that right?

Mr. CHANDLER. That is right.

Senator HUMPHREY. There is one private firm involved, as I understand.

Mr. CHANDLER. I think that is correct.

Senator HUMPHREY. The co-op principle has been proven and practiced in the region through the success of the cooperative distribution entities; is that correct?

Mr. CHANDLER. The distributors don't have leverage over the decisionmaking process at TVA. It doesn't work from the bottom up that way.

Senator HUMPHREY. But the concept of cooperatives as opposed to commercial entities has worked well in the distribution of TVA power. Is that a correct observation?

Mr. CHANDLER. Well, the freedom of those cooperatives is something that has been disputed. I remember a pretty interesting book on that subject called "Sparks at the Roots" by Victor Hobday that stated that they did not have very much flexibility or control.

Senator HUMPHREY. You are saying in this unique circumstance you can't really say how well they worked, because they have so little control over the basic cost of what they sell.

Mr. CHANDLER. I think that is true.

Senator HUMPHREY. Has anybody ever made such a proposal?

Mr. CHANDLER. To do one of these things that I am suggesting here?

Senator HUMPHREY. The particular one that involves giving a title, in fact, a cooperative, which would be given to the people of the Valley. Has anyone ever made such a proposal?

Mr. CHANDLER. Not that I am aware of.

Senator HUMPHREY. You can claim the paternity to that.

Mr. CHANDLER. Maybe I can find someone else to claim that.

Senator HUMPHREY. You are a native of Tennessee, and have family there, I suppose. How do you suppose such an idea would go over?

Mr. CHANDLER. I think it would require some discussion. I think a lot of people are ready for that kind of discussion. I can't predict or I won't predict how it would end after that discussion, but I think it might be a good debate.

Senator HUMPHREY. Let's talk about the employees. They are a party with vital interests in such a proposal, or in any proposal, in fact, affecting TVA. How many employees are there? Do you know?

Mr. CHANDLER. I have lost count. It has gone down in recent years, and I don't have the exact number.

Senator HUMPHREY. It is in the thousands, surely. How would they be affected? Let me ask you this: Are their salaries and benefits, including time, fully paid for by TVA? Is there any Federal involvement? They are not civil service.

Mr. CHANDLER. Not in the power system. They are not civil service as far as I know.

Senator HUMPHREY. The total at TVA is 32,000 employees, and as much as 95 percent of the TVA's revenues are public power. Presumably, there is a similar relationship in the number of employees. So that is 20,000 to 30,000 that would be affected. They are not presently Federal civil servants. They are truly employees of TVA; is that correct?

Mr. CHANDLER. That is correct; of the corporation.

Senator HUMPHREY. Including the retirement funding and so on?

Mr. CHANDLER. I assume so.

Senator HUMPHREY. You got their attention right off the bat.

How would you propose to deal with the employees in such a proposal?

Mr. CHANDLER. I think if the problem that Chairman Dean raises about the brain drain is a valid one, and people tell me that it is, then perhaps the employees as well as the system itself would benefit from being separated from the Federal control over salaries so that market salaries, the going rate for managers, could be paid.

Senator HUMPHREY. They would automatically become employees of the cooperative, you envision, at present or better rates of pay. Is that what you are saying?

Mr. CHANDLER. I think so, yes.

Senator HUMPHREY. And with the same benefits? I assume there is a labor agreement. I know there is some TVA people out there, because I see heads going up and down. I am getting my answers by telegraph out there. Are there labor contracts; do you know?

Mr. CHANDLER. I think you should ask them.

Senator HUMPHREY. I don't want to violate procedure here. Then everyone will want to come up and testify. I can't do that. We will have to look into that. We will get that from TVA.

In any event, you would envision the continuation of a commitment in statute, perhaps, in ensuring that current employees will continue at present or better rates of pay; that all of their benefits would continue?

Mr. CHANDLER. Yes. I want to be clear that my comments on the efficiency of the operation of TVA have to do with the basic system, the organizational system of the enacting, enabling legislation, and not the quality of the TVA staff itself. I think it is staffed by competent, capable, dedicated people.

Senator HUMPHREY. That is an important distinction. I hope that I have, likewise, made that distinction. If I haven't, I do now. I have never questioned the personal integrity or judgment of the current players. I do suggest there are structural problems which lead to extensive mistakes.

Dr. Cuoto, sorry to keep you waiting.

You seem to take some satisfaction and encouragement in the movement by TVA in recent years toward a more genuine concern for the interests of the valley.

Still, the structure has not been changed. There has just been a change in attitude on the part of the current Board members. Is that a fair observation?

Dr. Cuoto. I think it is somewhere in between. I think that there are definitely changes in attitudes of the Board members. There have been changed policies; there are new staffing patterns; there are regional offices; there have been structural changes within

TVA to create greater accessibility beyond just the changed attitudes of the Board members.

Senator HUMPHREY. So there have been structural changes to facilitate easier access by the people to the authority?

Dr. CUOTO. That is correct.

Senator HUMPHREY. Presumably, the authority, and the Board members have a better quality of input. I hate to use that phrase, a better quality of input.

Dr. CUOTO. I think they have made efforts to see that diverse groups and interests previously excluded are represented in the decisionmaking process. Going so far as initiating contact with groups and inviting them to Knoxville for seminars with TVA staff, both to learn from them as well as to instruct those groups about TVA's policies.

Senator HUMPHREY. Do you have any feelings or have you expressed any feelings or findings about completion of the Columbia Dam?

Dr. CUOTO. I have some impressions. The link between GM's location there and the Columbia Dam is not very clear to me. I think one has to take a quantitative leap of faith in that regard. I think that leap of faith is based on the myth of TVA back in the thirties and forties about infrastructure attracting industry.

I think the bottom line is that the Columbia Dam will be built only with congressional appropriations. TVA won't invent that money to build it.

Senator HUMPHREY. We will invent it.

Dr. CUOTO. Excuse me?

Senator HUMPHREY. We will invent it. That is almost how we pay for a great deal of what we spend.

Dr. CUOTO. I think the lesson of Tellico is very instructive. There was not only local opposition, but there was opposition within TVA.

I think at least one part of TVA was opposed to that dam, but it was a congressional mandate to complete it in a quite extraordinary action.

The point I want to make is that some of the worst successes in recent years are due to forms of political accountability such as Congress.

Senator HUMPHREY. I would hate to view that process as accountability. When you talk about Tellico, I remember that well. I am embarrassed to say that I did not vote on an informed basis on that question. I thought the controversy had to do with the presence of the snail darter holding up the completion of a project on which many thousands had already been spent at that point. But the fact was that the dam wasn't economically justifiable to begin with. We didn't know that. That can hardly be called oversight.

Dr. CUOTO. There was a select committee set up by the Congress, at least one select committee that came back and released three different findings that it didn't meet a cost-benefit ratio.

Senator HUMPHREY. It was a sorry episode with tragic, and apparently irreversible, consequences. In your statement, you say TVA accountability to its friends and its critics in Congress explained some of its worse excesses, including recent unjustified and

unwarranted water projects. That is precisely what you are talking about.

Dr. CUOTO. Talking about the Columbia, yes.

Senator HUMPHREY. I would not want to characterize that as oversight by Congress, but, rather, a result of short-circuiting the more regular procedure.

Nevertheless, the structure remains the same. Isn't it possible we are seeing it happening again with Columbia? The structure is the same.

Dr. CUOTO. I think additional structural changes are needed, but the one I propose is to marketize TVA a bit more by creating structural changes within the distributed system. There are 160 distributors of TVA power within the valley. They are the most organized constituency for TVA's policies in the power program and in the nonappropriated projects, as well, I would say.

They represent overwhelmingly industrial interests, people interested in expansion, people whose definition of growth is industrial development.

I think since they came to power in the late 1940's and 1950's and gained real power, gained real influence within TVA's policy by their ability to relate to groups important to TVA, including Congress, which provided the funds up until 1959.

I think the questions related to power production are broad and do involve environmentalists, conservationists and the ratepayer. The ratepayer is more involved now because the marginal cost of electricity has started to increase. Maybe up to a decade and a half ago, it was decreasing.

So the industrial users' push for more plants coincided with residential interests because the rates were going down. But the rates are going up, and every new plant means higher rates, as the nuclear construction program proved very conclusively. I think the residential and industrial ratepayers' interests no longer coincide. They come in contact sometimes. That was demonstrated during the appropriating hearings a few years ago.

Consequently, I think the ratepayers need more representation on the distributor boards. I think environmentalists need more representation on the distributor boards, as do people in alternative energy and conservation. They are not represented adequately now.

Senator BURDICK. I just have two small questions.

Senator HUMPHREY. Senator Burdick?

Senator BURDICK. Dr. Cuoto, could you give me a few more specifics of TVA's present work in economic, community, and human resources development, what they have done and what, in your opinion, they should be doing?

Dr. CUOTO. I can give you some impressions.

I work with a number of voluntary agencies throughout the Tennessee Valley in health care, primarily, but in a lot of issues related to health. We can call on TVA for assistance, and generally, the staff there is very willing to hear us, et cetera.

They either don't have the wherewithal to really mobilize resources or for some other reason can't do it. But some of the response has been disappointing.

Now, whether that is an institutional structural incapacity or whether it is an inability within the agency, it is not clear to me.

They have assisted community groups in planning; they have assisted community groups on a volunteer basis and mobilized resources for groups. Let me give you a specific that will help out. In Virginia, a group, the Dungannon Development Corp., is trying to create a second shirt factory. Dungannon is a community in southwestern Virginia. TVA has provided them technical assistance, people coming onsite, giving them advice about plant location, et cetera.

They also helped locate a warehouse that is no longer needed for the Phipps Bend nuclear construction site and were helpful in making arrangements to transfer that warehouse to Dungannon.

They are helpful in that way.

Another specific instance is the valley is guarded with a number of community health clinics that started since about 1975, and I would say a majority of them had assistance from TVA in some way, again, very helpful in offering, loaning, or lending or selling surplus trailers which housed the clinic services eventually.

I think, in point, that represents the ghost of Arthur Morgan within the TVA towers of Knoxville, this reminder that we are in business besides power and we have to be concerned about the human resources.

I don't think the mission ever got full play within the agency, and in recent years, it has been continually diminished with the diminution of congressional appropriations.

In 1980, TVA sponsored a study as to what it should be doing in the nonpower programs.

Unfortunately, after a long period of time, it came down, basically, to using the power program and using the power program to leverage what could, in human development, change. It is almost as if the healing hand of "Freddie Kilowatt" was going to change conditions in the valley.

One of the problems of TVA in recent years is the power program, specifically in terms of its relationship with nonpower programs, goes off everything else. Your addage is if your only utility is a hammer, you tend to treat everything like a nail.

In the Valley, they do that, as well. With the power program being so dominant in the agency, many other missions of the agency come to be defined in terms of power.

Senator BURDICK. Do any of TVA's programs serve as what you would call a national demonstration effort?

Dr. CUORO. I think some of the work in health care is certainly worth taking a look at. Fertilizer, by definition, is a national demonstration.

I think that, frankly, just barely; they are worth looking at. I think it is a combination of resources and commitment that go hand-in-hand in some synergistic way, and it is looking there to say it is a really sterling example of what this Nation can be proud of and a model to other sections of this country, as well as Third World countries.

If that is what you mean by national demonstration, I don't think it is there. But I think they have a credible program of community assistance, on the other hand.

Senator BURDICK. Thank you. That is all.

Senator HUMPHREY. Examining the worst excesses, again, and trying to find their causes, Dr. Cuoto, in effect, history would show that Congress imposed Tellico on the people, on TVA; am I right in that? TVA did not want it, or am I wrong in that?

Dr. CUOTO. There are indications they dragged their feet on it.

Senator HUMPHREY. In any event, Congress imposed that thing on the valley, flooded Tennessee, destroyed all those archaeological sites, the cultural history, for no good reason. Congress did that to the people of the TVA region. Now it is possible that that same process may be used to complete the Columbia Dam.

Yet your testimony would indicate that you don't seek or recommend any structural change that might prevent such abuse of power and such a lack of accountability.

Dr. CUOTO. On the contrary, I think my testimony is indicating where that change really has to come from, and that is the grass roots. I think the decisionmaking, the influence structure within TVA needs to be changed. I think it can be changed best by incorporating structurally other interests that have become more paramount in recent years in terms of power production, the environmentalists, conservationists and the ratepayers. They are largely excluded or invited as special interest groups or as interest groups in public forums.

I think they need to be better built into the regular decisionmaking process of TVA.

Senator HUMPHREY. Right. Nevertheless, if TVA chooses, for whatever reasons, for reasons of pressure or perceived logic or whatever, to go ahead, for instance, with the Columbia Dam and to complete it, there is nothing any of those groups, whatever access they might have, can do to prevent it?

Dr. CUOTO. That is where Congress takes over. I think their access to Congress is the next step; if they fail within TVA, then the access to Congress. But very often, in recent years, TVA has been acting in response, anticipated or real, to congressional direction. That was the point of the other successes I think. The clearest message, if you review the oversight hearings, and if you review in some of the appropriation hearings, the clearest message TVA got through the sixties and the seventies was rate hikes, rate hikes, rate hikes, and that put a lot of pressure on the agency to continue the environmental subsidies, including the dirty air emissions.

I think one has to be very clear as to how we measure TVA's goals and TVA's achievements. In 1940, David Blumenthal mentioned kilowatt hours. After them, in the sixties, we mentioned them by low rates. I think we need to develop a more complex measure as to what is the job that TVA is doing, because the rate increases since 1977, I think, have to be divided between those rate increases which represent the mistakes of an overexpansion into nuclear, which are lamentable, but other rate hikes represented an end to the social environmental subsidies.

It was an attempt to get cleaner air that also led to rate hikes. So if the message of TVA is keep those rates low, then they begin to look within themselves and say, "How can we keep rates low?"

There is a danger of a reversion back to environmental and social subsidies. I think one has to be very careful in one's message.

The point I am making about the existing structural grass roots decisionmaking participation in TVA right now is that the distributors are overrepresented by those people who still feel that those environmental subsidies were somewhat justified and that the social costs and the environmental costs were excessive and should not have been incorporated. That is a broad statement, but it is the beginning of a discussion more than a concluding note.

But I think there needs to be more balance at that level within TVA.

Senator HUMPHREY. Do you see the filing of citizens' lawsuits in the late seventies as having been a factor in bringing TVA into a more willing attitude to listen to the people?

Dr. CUOTO. Literally, it was a court of last resort. I think failures within TVA and failures within Congress led people to go to the courts.

I think one significant change was that some of those actions were taken out of the courts and settled internally among the disputing parties, clean air being among them.

Senator HUMPHREY. But only out of fear that if a suit came to a conclusion that there would be massive penalties accruing to TVA.

Dr. CUOTO. That fear, plus a changed attitude within TVA. I think there was a change in the Board membership that also was conducive to successful negotiations.

Senator HUMPHREY. Gentlemen, your testimony has been very helpful.

Finally, let me put this question before you. To whom do the people of the Tennessee Valley turn in the wake of errors and poor decisions made by the Tennessee Valley Authority after the fact?

Dr. Cuoto.

Dr. CUOTO. They turn to two people: They turn to themselves and organized groups, very often protest groups which eventually, I think, are getting fairer and a more tremendous hearing within TVA, and they also turn to Congress.

Senator HUMPHREY. Good luck. What did they get after Tellico from Congress? Nothing.

Dr. CUOTO. I am not sure after Tellico, but clearly in the sixties, when there was less access within TVA, they came to Congress regularly indicating some of the changes that were eventually incorporated.

Senator HUMPHREY. All right. Mr. Chandler?

Mr. CHANDLER. The only thing I would add to this is they also turned to the appointment process, that is, to the President, to try to influence the appointment of directors. I think they have gone a long way between Knoxville and Washington.

Senator HUMPHREY. That is right. Colonialists have to go to London to appeal to the King.

Mr. CHANDLER. I did not say that.

Senator HUMPHREY. I know. That was my statement. The resource they have is to travel across the oceans and appeal to the mercy of the king, who is under political pressure from other places.

Dr. CUOTO. If I may, I would like to comment on some ideas that have been expressed, specifically, the inspector general. I think that person comes out to who will guard the guardians, and it

leaves other questions unanswered. If the present structure is not working, how will an independent inspector general resolve the question? It changes the question of accountability from three appointees to one appointee.

Who will that person report to?

Senator HUMPHREY. I would like them to report to me, actually, but I don't think I can arrange that.

Dr. CUOTO. Before going to those arrangements, I think we need to look seriously at what changes could be made within the existing structure, including more regular oversight hearings.

Senator HUMPHREY. The problem is that we, in Congress, are charged with overseeing every agency which is not created by the Constitution, and there isn't time to do it.

Therefore, this oversight on the part of the Congress to which you attach so much faith is vastly overestimated. We just don't have the time.

Dr. CUOTO. I don't know if that problem will be resolved by the inspector general.

Senator HUMPHREY. No, but let me just point out that, as I stated in an earlier part of the hearing, every Federal agency of any size has an independent inspector general, and so the objections which you raised, which have some degree of legitimacy, but nevertheless, have not been found to be sufficient to say: Well, let the agency conduct its own audits. Let the Board of Directors, in this case, hire and fire the auditors.

Dr. CUOTO. There is one perspective on the three-person Board of TVA, is that they are three inspectors general, if you want, serving as appointees of the President and responsible to Congress. To a certain extent, they embody some of the characteristics of the inspector general already.

Senator HUMPHREY. All right. You have your opinion, and I respect it. But I don't like vesting in the same office the conduct of duty and the making of decisions on one hand and the analysis of those decisions on the other. I think it is a mistake to have that in the same office, which is essentially what we have today.

I guess we have disagreement on that point. I respect your opinion, although I don't agree with it.

Dr. CUOTO. May I just reflect a little bit on some of the discussion of the FFB? It seems to me that the, again, in the message to TVA about its accountability, that TVA plays to many different audiences. In listening to the OMB person, it seemed that three different parties were mentioned in terms of TVA's accountability: One was the ratepayer within the valley; one was the Federal taxpayer; and one was the hypothetical person standing in line to buy bonds.

The TVA represents a disadvantage. TVA's borrowing from the FFB represents a disadvantage to a person in line to buy bonds. It represents no disadvantage and perhaps a slight advantage to the Federal taxpayer, and to the ratepayer within the valley, it represents acute good management to go to the cheapest source of capital in order to keep rates down.

So again, we have different purposes for TVA; different accountability and different audiences as far as policies.

Senator HUMPHREY. Right. We could go on, I am sure. In the interest of the witnesses who are to follow, Senator Burdick?

Senator BURDICK. No. I thank you very much.

Senator HUMPHREY. Thank you.

We would invite now to the table Dr Mohamed El-Ashry, senior associate, World Resources Institute; Mr. Richard Ayres, senior attorney, Natural Resources Defense Council; Mr. Dean Hill Rivkin, professor of law, University of Tennessee, Knoxville, TE; and Dr. Brent Blackwelder, Director of Water Resources, Environmental Policy Institute in Washington.

Senator BURDICK. Mr. Chairman, it is now about a quarter to one, and I have a conflict. I wonder if I may be permitted to submit some questions to these four witnesses?

Senator HUMPHREY. Of course.

Senator BURDICK. You may hear from me by mail.

Senator HUMPHREY. I apologize, but I don't know who how you are arranged out there. Starting on my left, tell me who you are.

Mr. RIVKIN. Yes; I am Dean Rivkin.

Mr. AYRES. I am Richard Ayres.

Mr. BLACKWELDER. Brent Blackwelder.

Mr. EL-ASHRY. Mohamed El-Ashry.

Senator HUMPHREY. Thank you.

All right. We will start in the order of the printed agenda, with Dr. El-Ashry.

**STATEMENT OF MOHAMED T. EL-ASHRY, SENIOR ASSOCIATE,
WORLD RESOURCES INSTITUTE, WASHINGTON, DC**

Mr. EL-ASHRY. Thank you. Thank you, Mr. Chairman. I am pleased to appear before you to share my views on the Tennessee Valley Authority, particularly in the areas of natural resource management and the environment. I must emphasize, however, that I am not testifying here in my capacity as senior associate with the World Resources Institute. My testimony is based on experience and knowledge in the TVA during 4 years as the agency's Director of Environmental Quality. I have submitted written testimony and with your permission, I will try and summarize it in the 5 minutes I am supposed to have.

Senator HUMPHREY. Fine.

Mr. EL-ASHRY. Mr. Chairman, I am not here today to praise a particular natural resource program at TVA or to plug one or more of the environmental policies that were implemented at the agency during my tenure. And I will not enumerate the many achievements or shortcomings of TVA in the first 50 years of its history. Other witnesses have already done that or will be doing that.

What I am going to address, instead, is whether TVA can be of future value to the rest of the Nation, as it was during some periods of its past existence, particularly in providing innovative and cost-effective answers to the compelling energy and environmental problems that face this Nation. In other words, besides being a public utility, what should TVA's future mandate be so that continued investments of national taxpayers' funds can be justified?

TVA began life as a national demonstration agency. Congress and President Roosevelt intended the Tennessee Valley to be a national proving ground for new ideas, and they also wanted a series

of large public works projects that would help lift a sagging regional economy. But they left no misunderstanding as to TVA's greater role. On every TVA facility are the words, "Built for the People of the United States of America."

As TVA established and maintained a unified system for protecting, managing, and developing the Tennessee Valley's resources, it acquired a high level of expertise and capabilities and a large number of functional facilities, a combination unprecedented anywhere in the the public sector. TVA can and should utilize those facilities and expertise to help the Nation come to grips with current and emerging energy and environmental problems.

TVA would focus its unique capabilities on multifaceted problems and issues pertinent to the region but which also have national significance. The Tennessee Valley region has the advantage of being similar to several other parts of the Nation in terms of natural resources and environmental conditions.

While progress has been made toward meeting key environmental goals aimed at cleaning up the Nation's air, water, and land, the job is far from being complete. According to a 1982 GAO report, unresolved problems and emerging issues such as acid rain, forest damage from air pollution, nonpoint source water pollution, toxic and radioactive waste disposal, ground water contamination and reduced Federal funding will make attaining environmental standards more difficult.

When one considers that the major portion of these issues are related to energy production and use, it would not be difficult to visualize TVA and the Tennessee Valley region as a national demonstration and proving ground at the energy and environment interface.

In addition, hundreds of billions of dollars have been spent by public and private entities to achieve national environmental quality goals, mostly in energy and related industries. When one realizes again that it is also estimated that over \$700 billion will be spent on pollution abatement in the 1980's, the urgency for the Nation to seek alternative energy technologies and cost-effective environmental protection methods becomes obvious.

In order for the mission outlined above to be successfully carried out by TVA, however, a number of actions, both internal and external to TVA, must be taken. Key among these actions are the following:

One, TVA should clearly articulate its future mission and an implementation plan and Congress should reaffirm such mandate and designate the agency as a national energy and environmental demonstration agency.

The reason behind this, Mr. Chairman, is that, in my opinion, there seems to be a tremendous confusion, not only on the outside, but even within the agency, as to where the agency is supposed to be going in the first place.

Two, TVA cannot support such a program solely by power program financing or by current levels of appropriations. Increased congressional appropriations will have to supply the majority of the needed funds.

Three, increased methods of appropriations should carry with them a higher level of accountability on the part of TVA.

Four, TVA should avoid duplication of State and other Federal agencies' efforts in the region and should act as a catalyst for regional development and improvement by providing concepts, technical knowledge, and demonstrations to solve regional problems.

Five, strong agency leadership and commitment is a must for this concept to succeed. Such leadership and direction are most needed at different organizational levels to allow the many competent employees to make the necessary contributions to the agency's central goals.

Six, TVA must be willing to internally reshape some areas and reduce and eliminate some programs and activities, as well.

Mr. Chairman, in closing, let me say that TVA has not outgrown its usefulness to the Nation. On the contrary, TVA must renew its original mission and mandate by being a national demonstration for developing practical and cost-effective solutions to pressing national energy and environmental problems.

TVA has the necessary facilities and expertise, and the potential for making a significant national contribution in the years ahead, a contribution that could well surpass past accomplishments. But TVA would have to make some adjustments, and it would need lots of support from within as well as from outside the valley.

Thank you very much.

Senator HUMPHREY. Thank you, Dr. El-Ashry.

Mr. Ayres.

STATEMENT OF RICHARD AYRES, SENIOR ATTORNEY, NATURAL RESOURCES DEFENSE COUNCIL, WASHINGTON, DC

Mr. AYRES. Yes, Senator Humphrey. I also appreciate your invitation to come and share my experience with TVA with the committee.

I came to know the Tennessee Valley Authority through litigation. Along with Professor Rivkin to my right, I handled litigation for 10 citizens' organizations against TVA for violations of the health standards in the Federal Clean Air Act.

I think these hearings are a great service, Mr. Chairman. TVA has too seldom, I think, received the benefit of having its policies aired here in Washington.

Obviously, I cannot speak to many of the issues that are the subject of these hearings, in particular those related to financial questions. My message would be that one should separate those from the issues that I am here to address.

I have seen a lot of TVA's air pollution control program, and I think that TVA can continue in the future to serve some very important functions with respect to environmental policy—first, as a yardstick for the performance of other utilities, and second, as a unique laboratory to develop new technologies and programs dealing with environment and energy issues.

To do this, though, TVA must have leadership committed to this kind of vision of the future. Let me first address the issue of TVA as a yardstick.

As you know all too well, Mr. Chairman, controlling the emissions from private utilities is a very major issue in the utility industry as a whole at this point. New Englanders have seen the ef-

fects of this pollution through acid rain. It has reached the point where it is clear to almost everyone outside the utility industry that it is time to apply available techniques to clean up the high sulfur coal-burning utility plants.

But within that industry, only TVA has articulated agreement with this point. And only TVA has proven that cutting emissions of sulfur oxides in half, as recommended by numerous scientific bodies, is practical and affordable. While other utilities, as you have seen, have spent small fortunes on studies and progadanda to prove that acid rain "does not exist" or is "harmless" or is "too expensive to do anything about anyway," TVA has had a control program going into place that shows the hollowness of these claims.

TVA has not always been a leader, I might add. In the early seventies, TVA was the leading exponent of the "up, up and away" theory of pollution control: tall stacks. In 1973, TVA went all the way to the Supreme Court to argue that it was not required to get State permits under air pollution control laws.

When we sued, TVA was the largest air polluter on the North American continent, emitting 2.4 million tons of sulphur each year. That is about 10 percent of today's national total. But that began to change when we brought suit, and when David Freeman and then later Richard Freeman were appointed to TVA's Board of Directors. They probably could have tied up this litigation in the courts for a long time. They didn't.

Instead, they led TVA into sitting down to hammer out a negotiated settlement. Within 1 year, we arrived at a workable cleanup program that balanced the interests of ratepayers and the public interest in healthful air quality. I would compare this to the record of other utilities which have used every resort whenever an issue of enforcement came along to hold off the day of reckoning.

I would also note one irony in this. The agreement, after it was reached, was stalled for almost 2 years because of the intervention of the power distributors in the Tennessee Valley. These same cops that we were hearing earlier today described as responsive were trying to slow down the air pollution program, cut it down, make it smaller, and, in general, resisting the thrust of the negotiated agreement to clean up the air.

That performance suggests to me that the issue of responsiveness and accountability may be a complex one and it is something to keep in mind when thinking about that subject.

As a result of its program, TVA cut its emissions by more than a million tons. Emissions in 1983 and 1984 were down to about 1 million tons, which is 1.4 million less than they were in 1977. The capital cost of this program was substantial. It was \$1.3 billion. The annualized costs were about \$390 million. But the maximum rate increase was held to under about 10 percent, and the cost of sulfur removal held to a highly cost-effective about \$375 dollars a ton. That is approximately, by the way, the same as the estimates that have been made for the cost of control programs like the Senate bill that was passed last year.

TVA is the only high sulfur coal-burning utility I know of which has publicly supported further emission reductions to control acid rain. TVA has laid out a program for how they would achieve the reductions called for in the Senate bill and last year's House bill.

They have also made suggestions which, the Senate might or might not agree with it, but which are positive suggestions, I think.

In other words, TVA's program has become a yardstick for other utilities. Unfortunately, it shows that most of the other utilities aren't doing very well. But in the absence of that program, we would not have that yardstick; we would not have the ability to hold others up to that example.

I think the air-pollution program has propelled the agency into a leadership position on accountability within the utility industry, too. The industry as a whole has a pretty poor record on this. I am not sure that I see a lot of difference between the public and the private utilities in this regard in the past.

I am obviously an advocate of greater accountability, but I think that it would be a mistake to concentrate entirely on TVA, the public utility, and forget about the fact that this is a reform needed elsewhere, too.

As I mentioned in my written testimony, TVA evolved a committee called the Implementation Committee, which is unprecedented. It involved citizens and their lawyers as well as State and Federal Governments and TVA employees in working through a long and complex control agreement. I think it was a very positive development, and one which TVA has apparently emulated elsewhere. Besides being a yardstick, TVA has a unique function as a laboratory for cleaner power technologies. When you deal with public policy issues, their political difficulty often has to do with whether or not technologies are available to deal with them.

Twenty years ago, there were no scrubbers. Right now, if some other technology were available which was much cheaper, acid rain would be a much less contentious issue. Likewise, I think, in the energy area, energy conservation measures could reduce some of the controversy there.

TVA is uniquely able to serve as a laboratory to develop answers to these problems, in my opinion. Private utilities have not served this function. Whether it is because they don't want to, because they are afraid they will have to use technologies once they develop them, or whether it is because they figure stockholders and public utility commissions would wonder why they are spending the money, I don't know.

But the result is that they don't spend the money for these kinds of research projects. They have also been very slow to exploit the potential for energy conservation.

On the other hand, EPA has no ability to do this research, because they don't have powerplants. TVA does, and I have laid out in my testimony some of the very important work that they have done on pollution control technology.

So in sum, I think that TVA does have an important role for the future as a yardstick and as a laboratory in the areas of public interest in the utility industry. I would recommend that Congress do what is necessary to improve and expand on that. To my mind, the most important factor affecting TVA's potential to do that job is its leadership.

TVA began to fall away from doing these jobs during a period when its leadership lost that vision. It has come back as a result of

new leaders who have seen these functions as important ones for TVA.

As an outside observer of TVA I would like to emphasize the difference in the kind of attitude which I have seen there and at other utilities.

TVA continues to have among its staff a feeling that their mission is something larger than just making power, even though, as other witnesses have said, the power tail wags the TVA dog pretty hard these days.

Nevertheless, that staff was different in its attitudes from those in most private utilities. To me, that seems a very important public resource that should not be sacrificed.

It is very important that in overseeing TVA we do not throw the baby out with the bath. So I commend your efforts to oversee TVA and hope that we keep that in mind as you move forward with that.

Thank you, Senator.

Senator HUMPHREY. Thank you.

Professor Rivkin, you are next.

**STATEMENT OF DEAN HILL RIVKIN, PROFESSOR OF LAW,
UNIVERSITY OF TENNESSEE, KNOXVILLE, TN**

Mr. RIVKIN. Thank you, Senator. I, too, appreciate the opportunity to share with this committee insights I have gained about TVA since my student days at Vanderbilt University. During the last 15 to 17 years, TVA has been an object of much of my scholarly attention. It has also been a defendant in major pieces of litigation in which I have represented grass roots groups in the Tennessee Valley. This litigation is recounted in my written testimony. I think it is fair to note for the record that there is one case that is currently pending that relates to some of the conversations and discussions that have gone on today. This case challenges TVA's position that it has no discretion under the TVA Act not to pass the costs of construction, primarily of the nuclear powerplants, to present-day consumers.

This is an issue that, as the Senator is aware, has arisen around the country in various public utility commissions, and I note that because it is currently a pending case, and I want the record to reflect that.

My written testimony, if the Senator has seen it, indicates that, after a very long period of time in which TVA has been no friend of the environment, in my opinion in the course of the last 7 to 8 years, TVA has embarked on a course of stewardship, innovative stewardship that has the potential to fulfill the very far-reaching original aims of this enterprise.

What I would like to do, if I may, in the short time that I have available, is to summarize some of the points that I make in my testimony; in particular, I would like to address four of them:

First, why TVA abdicated its responsibilities to the environment? Second, a very short review of some of the positive developments that have occurred; third, the national implications of these; and finally, what the future may hold.

First, I think the question of TVA's abdication of its environmental responsibilities during the sixties and the seventies is the subject of another book. It has been touched on here in some of the testimony, and I am sure that the Senator is getting a good picture of the complexities of that. Some have said that TVA's environmental responsibilities were abdicated because it focused exclusively on the goal of cheap power to the exclusion of other aims that are contained in the TVA Act.

Others will look on the evolution of TVA and say that the agency embarked on a large coal-building program in the forties, a large nuclear program in the fifties, and the inexorable force of the bureaucracy behind these programs led into conflict with the emerging environmental and consumer groups in the seventies. There are other reasons that people have ascribed to the insularity that took over TVA during the 1970's with respect to environmental as well as consumer issues.

The main issue, and I think the Senator is correct in focusing on this, is the issue of accountability. I thought a good deal about what the question of accountability means in general, but in particular with respect to an agency like TVA. For some, accountability is when someone or an agency does what you want it to do; it is accountable. You go home feeling good.

Senator HUMPHREY. Like my staff.

Mr. RIVKIN. Second, the idea of accountability is that there are open and fair processes of decisionmaking, so that everyone has as much input as possible—and, like you, I don't like that word, either—but that everyone has a fair opportunity to comment and to respond; that there is due process in the broadest sense; that the power is equalized among the groups that do not have the resources to develop testimony and data and expertise and the like; and that what emerges out of that process, despite the fact that some groups don't like it, is a notion of accountability.

A third idea of accountability, I think it is fair to say, is that attitude is an important part of accountability. I don't mean public relations or just imagery, but there is a notion of dealing with an entity like TVA, as large as TVA, and coming back feeling that they have responded to their concerns in a fair, in an open, in a nonadversarial manner.

I think that in the past 8 years, TVA has taken long strides from a very dismal history in the sixties and in the seventies of accountability, primarily with respect to environmental and consumer issues, toward an internal ethic, if you will, of accountability.

I am not ready to say that that ethic can't be, in the next couple of years, changed. It certainly can. I think one of the aspects of the TVA charter that the Senator is focusing on here today is its extraordinary flexibility. The TVA charter has, within it, the potential for great good, exercised with great discretion on the part of the leaders of this agency, the managers.

But any charter that is that flexible also has the potential for great bad, exercised with the same kind of discretion by the managers.

Senator HUMPHREY. Permit me to say, that is true of any dictatorship.

Mr. RIVKIN. It may be.

Senator HUMPHREY. Enormous power for either.

Mr. RIVKIN. I don't view the TVA as a dictatorship. I think there are checks and balances being built internally. I think that the Senate, this body, has built in the form of citizen suits and the like that ensure at bottom, that the excesses will not persist for a very long period of time.

What has TVA been doing concretely to recapture what I view as an original ethic of environmental concern? My testimony lists a number of programs. Dick Ayres has talked about some of the air pollution programs, which I think are a central feature of the agency's environmental makeup today.

The water resources policies of the agency are extremely progressive with respect to stream channelization, and, I believe, the future or nonfuture of dam building with respect to TVA.

There is attention being given to releases from reservoirs and the like that also, I think, have national implications for dealing with problems such as that. The agency's role in ameliorating the impacts, the substantial impacts of stripmining on the TVA region, I think, must be mentioned and have national implications, as I will note in 1 minute.

The agency's work in toxic and hazardous wastes problem-solving has been, I think, an extremely effective program in the valley and should continue.

There are a number of other programs that are worth mentioning, the Land Between the Lakes program, which is a model of environmental stewardship involving recreation and environmental education; soil and water conservation programs and the like.

A number of these programs—and I am sure that these have been set out for you by the agency, and I don't need to go into the specifics—have, in my opinion, national implications. No. 1, the integration of the country's largest utility with an environmental sensitivity, an emerging environmental sensitivity, I think, holds the potential for the kind of programs that you heard about today and, I am sure, that you will continue to hear about.

Second, the large presence of the Federal Government itself in the Tennessee Valley, and I think of the Oak Ridge "reservation," as it is called, as an example. Indeed, TVA calls its powerplants reservations, which certainly it connotes other images—

Senator HUMPHREY. It seems appropriate.

Mr. RIVKIN [continuing]. To what we have been talking about.

But for example, the presence of large quantities of toxic substances in the environment of Oak Ridge, which has come about as a result of Federal Government, DOE activities there, is the subject of a great deal of attention, true, by Federal regulators, by State regulators.

But TVA has been playing an extraordinarily useful role in monitoring data gathering with respect to the problems there. TVA played the same role with respect to the problems in Trianna, AL, which was a serious toxic pollution problem that emanated from a Federal military facility.

TVA's resources, the years' long buildup of expertise in these areas, are being put to use in this instance or these instances with respect to problems that the Federal Government itself has caused.

A third area with national implications of some of TVA's work relates to the coal mining areas that TVA has had a substantial, and I should say, in my opinion, very negative impact on over the years. TVA is one of the country's, if not the country's largest purchaser of coal. They have purchased coal from all around central Appalachia, which many have termed a national energy sacrifice area.

I would like to make the point that if there is any change that might be made with respect to TVA's community development programs and money drawn from the power program, I would certainly encourage TVA to consider strongly community development programs in the coalfields that might, indeed, be paid for by power funds drawn from the entire TVA system, as well as appropriated funds.

Finally, TVA's programs of economic development for the rural poor, for the landless in the Tennessee Valley have the potential for developing models not only for national use, but certainly for international use. TVA's resources with respect to sewage treatment, land reclamation, drinking water, nonpoint source pollution, flood plain management all have been brought to bear in particular instances around the Tennessee Valley in very productive grassroots ways.

TVA's presence, I believe, in a number of areas—and I consulted widely with people before coming up here, before making these remarks—TVA is not as remote a bureaucracy as they are often painted to be. They are perhaps not as broadly based as they should be, but in the instances where they have pitched in with a number of these programs that are funded from the appropriated funds, I think that there is good evidence that people-controlled progress has occurred.

The future, it seems to me, is still very much up in the air. The initiatives of the last 5 to 6 years, I think, has been extremely encouraging with respect to the dual issues of environmental protection and accountability. TVA must build on these initiatives in creative ways or else I think they, too, can very easily go by the wayside.

They must also build on the notion of accountability that we have talked about today or else these programs that I think are quite instructive can easily go by the wayside. I think there is one thing that you can be assured of, though, and that is, if TVA abdicates its responsibilities as it has in the past, that the first people who will be, as has been indicated, organized and concerned about it and take action about it will be the people in the Tennessee Valley.

Thank you very much.

Senator HUMPHREY. Thank you.

Dr. Blackwelder.

STATEMENT OF BRENT BLACKWELDER, DIRECTOR OF WATER RESOURCES, ENVIRONMENTAL POLICY INSTITUTE, WASHINGTON, DC

Dr. BLACKWELDER. Yes. I would like to make four points in my testimony. I am director of water resources for the Environmental Policy Institute. We sponsored the work of Bill Chandler, who wrote the book, "The Myth of TVA."

The first point I would like to make is that TVA is often used as a model for international river basin development. The Third World countries have been told by us: If you dam up your valley and copy this model that you will create instant prosperity. Chandler has showed that a careful analysis of those results over 50 years reveals that flood control and navigation didn't pay for themselves and that many bad electrical power investments were made in dams.

Senator HUMPHREY. Excuse me for interrupting. What do you say to the criticism of his analysis to the effect that he did not compare it with other projects built by the Corps of Engineers? Is that a valid criticism?

Dr. BLACKWELDER. No, that is not a valid criticism.

Senator HUMPHREY. Why?

Dr. BLACKWELDER. If you made a similar comparison to some of those investments, you find a similar devastating critique.

Senator HUMPHREY. In other words, they are all bad, most of them.

Dr. BLACKWELDER. No; not all. What you find is that if you look at certain of the best sites, you got a tremendous amount of payoffs from projects like Hoover Dam or Grand Coulee. Then everyone pretended to believe, "Oh, well, let's do that, and by golly." It doesn't work that way.

What you find more and more, the case made by conservationists on the projects is based on economics. Unlike early projects on a grand scale, the economics are not there on far too many of these.

Senator HUMPHREY. Sorry for the interruption.

Dr. BLACKWELDER. That is just to continue a thought. What happens when you look at TVA as an international model? You find if you duplicate this dam-building river valley, all kind of problems creep up. They have different ecosystems; different schemes. One of the things that happens in a river project is onchocerciasis, river blindness, in areas where they had almost been eradicated by the World Health Organization. The reason is that warm climates reservoirs create habitats for the mosquitos, snails, and the black flies that transmit these diseases.

Dams in the Third World have also had incredibly rapid rates of sedimentation, thus rendering their useful lives extremely short. They have inundated important areas from a scientific or environmental standpoint such as tropical forests, parks, refuges, and one of the most extraordinary consequences is the huge displacement of peoples by these projects. Here in this country, we have been concerned about dams displacing several hundred people. Well, projects are now proposed around the world that displace on the order of 100,000 or 200,000 people during the past decade. World Bank projects displaced 178,000 indigenous peoples with usually no

added plan for resettlement. These people are broken spirited as they are separated from the land to which they were attached. They are ridden with disease, and it is a terrible setback for an ostensible purpose of improving the quality of life of these individuals.

I would hope one result of the hearings would be to question the continued use of this model as the way to bring prosperity and improvement in the quality of life in the Third World. I think it is a disastrous way to go and would like to submit for the record certain background material to substantiate that particular point.

Senator HUMPHREY. Fine.

Mr. BLACKWELDER. The second and third comments I would like to make relate to the Tellico and the Duck River projects. Both of those point up the need for ending the self-authorizing procedure for TVA when it comes to water resources. I think one important step that this committee can take would be to reassert jurisdiction and require authorization of these projects. Just as the Army Corp of Engineers has to come before the Senate Environment and Public Works Committee to get its projects authorized, so TVA ought to do the same with its water resources development.

In particular, I would urge the committee to reclaim jurisdiction on the Columbia Dam project and insist that Columbia Dam needs to be reauthorized or actually receive authorization before it can be constructed. You certainly also could require that this benefit-cost analysis now being done come before the committee and receive scrutiny.

That is, I think, perhaps the most significant step you could take in the water resources areas: forcing the ending of that self-authorizing power of TVA.

I would like to make another point earlier that came up about Columbia Dam, which was concerning the relationship between the General Motors plant and Columbia Dam itself. The National Water Commission tried to come to grips with the question of does water resource development and the availability of water connect directly industrial growth?

The most careful and considered thinking on the subject is that there is no real connection there. There are so many other factors that enter into locations of industries, and the availability of water is not the crucial factor. In particular, it is my information that there is absolutely no connection between Columbia Dam and the location of this particular plant.

The final point I would like to make on Columbia Dam is that TVA's own staff identified an alternative with no dam that could be implemented at a fraction of the cost and provide all of the benefits declared as desirable for the dam.

Let me just make one comment on the Tellico project.

The major underlying rationale for the Tellico dam was the condemnation of private land and the eliminating of the residents, lands that were then resold by TVA at a profit for development around the reservoir. We submit that that is a very awkward position for a Federal agency to be getting into. It calls to light that kind of justification for a water development project.

I would say one thing: It is our judgment that if you wanted to reclaim the valley, that process could be done. It has not been un-

customary to think about how to get it back. You could simply lower the reservoir progressively over a decade or two and allow gradual recovery and end up with simply a dry dam. Dry dams do provide some flood control; in fact, better flood control than full dams.

The final point I would like to make in my testimony is that TVA has initiated a very good policy on stream channelization that could serve as a model for other Federal agencies. We would submit a copy of that to the record and stand ready to answer any questions you might have.

Senator HUMPHREY. Fine. Thank you very much.

Mr. EL-Ashry, you observe that there seems to be confusion both without and within TVA about its mission. Can you expand on that? Isn't its mission stated in statute? Isn't it clearly spelled out?

Mr. EL-ASHRY. Yes; but the situation becomes confused as we start tying and relating the mission to budget and budget cuts.

Senator HUMPHREY. Prioritizing?

Mr. EL-ASHRY. Prioritizing. I think Congress has a role, has been playing a major role in that there really is no long-term budget now. It is a year-by-year thing depending on what the passback is going to be and whether it is going to be 17 or 70 percent and which program is going to be cut. That hampers the long-term planning of a strategy similar to the one I am proposing.

Senator HUMPHREY. Time has changed. The act hasn't been amended since 1939, I gather.

Is its statutory mission consistent with what it should be? In other words, is there some new mission? Is it time to redefine the mission? What do you say the mission ought to be in the eighties and nineties and beyond?

Mr. EL-ASHRY. I think you will find that in my testimony, whereby the emphasis will be on the experience that has been gained by TVA and its expertise over the last 50 years. That is in the general area of energy and environment.

Some other people, I am sure, may argue that the economic development area is a much more important area. I cannot argue that. I can argue only for the area I know something about.

So in that respect, then, the charter does not need to be changed. The charter talks about TVA as being a national demonstration agency, about the Tennessee Valley as being proving grounds. So what we are talking about is articulating where the mission, where the focus of the agency is going to be for the next 10, 20, 30 years in terms of its value for the Nation.

Senator HUMPHREY. You served for 4 years in a position of high responsibility in TVA. When did you leave that agency?

Mr. EL-ASHRY. I left in October 1983.

Senator HUMPHREY. So your experience is recent. You call for, among other things, in your list of actions, for TVA, to quote you:

TVA should be required to justify its expenditures of specially appropriated funds, not only in terms of regional significance, but in terms of their national value, as well.

So you agree that TVA should not be able to self-authorize programs which require Federal appropriations.

Mr. EL-ASHRY. What I am suggesting there really is common sense. I am not talking about what is happening right now. I am not talking about money that is being spent on smaller programs. It is so small, and it is being justified in the budget presentations and in defending the budget before the congressional subcommittees. But if we are talking about increased funding in the future, clearly, there has got to be some accountability there, so that the taxpayer who is going to foot part of that bill to run some of these new programs that are going to be a value for the Nation be assured that that value is being returned.

Senator HUMPHREY. If TVA decides or is persuaded to seek appropriations to complete Columbia Dam, should those funds be authorized, or should they just be appropriated?

Mr. EL-ASHRY. I personally do not believe that the Columbia Dam ought to be built. I think it is a waste of taxpayers' money.

However, I must add one more thing. In the area of representation, people are talking about the colonial aspects of TVA and how we ought to return it to cooperatives and so on. It is the local people and cooperatives that are pushing the dam. In terms of democracy, it is the elected officials who are pushing the dam. Sometimes we confuse a few things as we start talking about the bigger picture.

But I personally do not think that the dam ought to be built, and there are many people within TVA who did not believe that and still do not believe that.

Of course, if Congress comes back, like in the case of Tellico, and says, "Thou shalt build Columbia Dam," I don't know what recourse TVA would have for that.

Senator HUMPHREY. And then whom do the people hold accountable? Accountability, then, has become so difused that no one knows how to hold anyone accountable.

Mr. EL-ASHRY. I would agree with my friend Mr. Blackwelder as to authorization. I think a project like that ought to go through the proper authorization process just like any of the large projects anywhere else in the country.

I think some of the new principles of cost sharing and so on should apply to it just like any other water project in the country, and let's put it through the mill like everything else that happens in other parts of the country.

Senator HUMPHREY. You also say that TVA should avoid duplication of State and other Federal agencies' efforts.

What examples of duplication can you cite?

Mr. EL-ASHRY. No specific examples, as such, but the tendency sometimes, when you have been in existence in a region and have helped in developing many of the aspects that go on in it for 50 years, you feel some kind of paternalism to some of the things that have been done there, and in the new scheme of things, there are other Federal agencies now, and the States have been building some of those responsibilities. Perhaps TVA ought to look at the future in terms of letting go of some of the things that has been close to its heart before.

Senator HUMPHREY. Many of the witnesses seem to agree that somehow TVA went awry in the sixties and early and middle seventies.

What, in your opinion, caused that? Why did that happen?

Mr. EL-ASHRY. Are you talking about the change in sensitivity?

Senator HUMPHREY. Do you agree that something went wrong with TVA in the sixties and the seventies?

Mr. EL-ASHRY. Yes.

Senator HUMPHREY. What was wrong and why did it go wrong?

Mr. EL-ASHRY. I think it was the narrow focus on producing electricity at the lowest cost possible, and that drove the agency and all its organizations to act and behave in that manner. So environmental considerations took a back seat approach. You will not spend on pollution control if you are going to have it relatively cheap. There is a cost that is involved there. You will not worry about water or pollution control from the dams if you are interested in keeping the costs cheap.

I personally believe that that was a bad situation. It was an attitude that was held strongly, and I think in a sincere way, perhaps, that this is the approach that ought to go, and perhaps demonstrating that electricity can be produced at the cheapest cost possible, and lots of it at the same time.

Senator HUMPHREY. What, then, is the essence of your testimony with respect to recommendations? Do you think that we just need to more clearly define TVA's mission? Is that it? Do you see no need for anything else?

Mr. EL-ASHRY. No, there is really more to it than that. I believe that the nation has invested enough funds and enough in the development of the Tennessee Valley Authority and the facilities that exist there. TVA has unbelievable capabilities in terms of actual facilities, expert individuals, and a tremendous amount of data and information that has been gathered over the years that could be utilized to help the rest of this nation.

We find that in developing our environmental standards and regulations, we carry out experiments under laboratory conditions isolated from the real world. Here in the Tennessee Valley, we have a real world situation in terms of measuring and applying and coming out with better solutions and better technologies for solving our energy and environmental issues, and that is really what I am proposing. We have an opportunity here, if we look at TVA and the region from the broadest sense, in terms of its national value and what it can contribute. That is what is being proposed here.

Senator HUMPHREY. I see.

Mr. EL-ASHRY. I will direct this question to you because of your background within TVA. As you know, one of the three positions of Director will be open within 2 years. Is it possible that the appointment of a new Director could shift the nature of TVA back in your own direction?

Mr. EL-ASHRY. I think that potential currently exists, because one is a minority. So decisions are made by a vote of two. That is a majority, is two.

So a change of one over the next 2 years would not really make any difference in the present situation. I think it is the current leadership that will either continue the approaches that have been adopted in the late seventies and early eightties, or they are going to reverse them. One person can make things known and advise, but that person can be defeated in a voting situation.

Could I just make a small comment on something that was mentioned in the earlier panel also?

Senator HUMPHREY. Yes.

Mr. EL-ASHRY. As far as the colonial aspects of TVA and the fact that a person, it is a very very specific point.

Senator HUMPHREY. Go ahead.

Mr. EL-ASHRY. It is that individuals now have the opportunity to comment but they have no recourse. This is not any different from EPA or DOE. When EPA proposes new regulations, it is open for public comment, and after that, that is it. You go to the courts if you don't like it. I don't think that people really ought to think in terms of "it is my view that ought to be adopted, and if not, I want to change legislation because it is not responsible for that". TVA does not differ from many of the Government agencies as far as openness. It is as open as DOE or EPA or any of these Federal agencies.

Senator HUMPHREY. That is a delicate point, but I would also observe that TVA affects the lives of a specific segment of our population, whereas those other agencies affect the lives of all of our citizens.

Mr. AYRES. Mr. Chairman, I thought Mr. El-Ashry was going to say something else. TVA is probably more open, at least as compared to other agencies, to our input from outside. As someone familiar with a lot of coal-fired utilities, my impression is you meet a stone wall, and that TVA, at this point at least, is a good deal more open to the public interest than the others are.

Senator HUMPHREY. I think we covered it for today. Thank you very much, gentlemen. The record will remain open for 1 week for insertion of statements of other parties who may wish to participate. Thank you very much.

[Whereupon, at at 1:35 p.m., the subcommittee was recessed subject to the call of the Chair.]

[Statements submitted for the record follow:]

STATEMENT OF M. KATHRYN EICKHOFF
ASSOCIATE DIRECTOR FOR ECONOMIC POLICY
OFFICE OF MANAGEMENT AND BUDGET

BEFORE THE

SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
SUBCOMMITTEE FOR REGIONAL AND COMMUNITY DEVELOPMENT

JULY 30, 1985

Mr. Chairman and Members of the Committee:

I am here today to discuss the Tennessee Valley Authority (TVA) and its financial relationship with the Federal Financing Bank (FFB). I would like to concentrate my remarks in two areas: (1) an analysis of the current subsidies to TVA resulting from FFB financing, in particular interest rate subsidies and possible future rollover of debt, and (2) potential improvements in the oversight of TVA.

However, before discussing these areas let me briefly describe the TVA mission and operations, review the President's 1986 Budget proposals for TVA programs, and provide some background and overview of Federal financing for TVA and other Federal power programs.

I. INTRODUCTION

- o The TVA was created by statute in 1933. Its responsibilities include improving navigation and providing flood control on the Tennessee River, promoting agricultural and industrial development and providing electric power to parts of seven states in the Southeast.
- o Initially, these activities were funded entirely with appropriations. In 1959, Congress separated the agency's program into two distinct entities -- power and nonpower. The power program was made self-financing through sales revenues from power customers, and was authorized to borrow up to \$750 million outstanding at any one time -- a limit that has been increased several times since -- also backed by sales revenues. The remaining nonpower programs were and still are financed by appropriations.
- o Today, the power program serves approximately 2.9 million households through wholesaling electricity to 160 municipal and cooperative distributors and one privately owned electric system. Electricity is also supplied directly to about 50 industrial customers and several Federal installations. Coal combustion provides 55 percent of the 32 gigawatt system capacity, followed by 18 percent nuclear, 14 percent hydro and 13 percent combustion turbine and pumped hydro storage.

- o The nonpower program includes natural resources management and economic development activities as well as a national program of fertilizer research and development. The natural resources management programs include navigation, flood control, recreation, fisheries, wildlife and forest development. Economic development activities primarily involve technical assistance to cities, towns, businesses and farm owners. The fertilizer program supports research and develops and test markets new fertilizer products and processes.

II. THE 1986 BUDGET

- o The 1986 Budget incorporates the most recent estimate of TVA borrowing requirements for new capital investment. The 1986 Budget continues the recent trend of reduced investment in nuclear power plant construction, with increasing financing from revenues. The 1986 estimate of new borrowing is \$375 million, a sizable reduction from the nearly \$2 billion borrowed annually several years ago.
- o In 1986, the Budget proposes major reductions in appropriations for nonpower programs, mainly in the areas of economic development and fertilizer activities.
- The Administration proposes to terminate Federal funding for TVA's economic development programs in 1986. On a national level, the Administration is seeking to promote economic development through overall tax and fiscal policy incentives rather than direct Federal subsidies. This reduction in TVA funding is consistent with Administration policy to terminate all but the most essential direct support for community and regional development, and to rely on the community development block grant program as the primary funding mechanism.
- Funding for fertilizer development programs is reduced on the assumption that the development and test marketing of new fertilizers should be totally self-supporting through increased prices on the sale of fertilizer products and/or industry cost sharing. This action is in response to a recommendation from the Grace Commission. Limited Federal support is provided for long-term fertilizer research.

III. TVA AND OTHER FEDERALLY-FINANCED ELECTRIC UTILITY PROGRAMS

- o The Federal Government is heavily involved in the electric utility business in the United States. Federally-financed power programs account for 15 percent of total electricity generation in the U.S. and about 17 percent of the externally-financed capital investment in new electric generation and transmission facilities. Appendix A to my statement shows the derivation of these estimates.
- o TVA is one of the three major Federally financed utility programs, the other two being the five regional power marketing administrations (PMAs) in the Department of Energy and the system of rural electric cooperatives, locally owned, but financed through the Rural Electrification Administration (REA) in the Department of Agriculture.
- o By itself, TVA is the largest single utility in the U.S. It currently accounts for five percent of all electricity generation and about three percent of all electricity capital investment.
- o This massive Federal involvement in electricity markets was originally justified on the basis of the high risk and high costs of constructing large hydroelectric facilities in areas of the country that had little or no existing market for the electricity. In the case of REA, Government support helped to subsidize the high costs of electrifying rural America.
- o These programs have largely succeeded in accomplishing their missions, and the rationale for providing large amounts of Federal support on generous terms is greatly diminished. Consequently, the Administration has sought to reform the financial practices of these programs to put them on a more business-like basis.
- In the case of the PMA's, the President's 1986 Budget proposed major reforms in the manner in which they repay their \$12 billion debt balance. Much of this debt currently carries very low interest rates (about 3 percent) and is not currently repaid on a fixed schedule. The Administration's proposed reforms would establish a fixed, straight-line amortization schedule for this debt, and raise interest rates to the current cost of Treasury borrowing. In effect, this proposal would put the PMA debt on the same footing as the TVA appropriations debt.
- The Administration has also proposed reforms in REA. And the Senate/Administration compromise agreement would provide for some reduction in the level of REA lending over the next three years.

- o The 1986 Budget did not propose any changes to the current financing arrangements for the TVA power program. In the Administration's view, the need for reforms in the PWAS and REA was more pressing. Moreover, the repayment of prior year TVA appropriations debt is already on a sound basis. The major issues regarding TVA debt, as I will discuss in a moment, concern the debt issued since 1959 and to some extent involve the repayment of debt that will be coming due in future years.

IV. ANALYSIS OF TVA POWER PROGRAM FINANCING

A. Structure of TVA Power Program Debt

TVA power program debt is essentially of three types:

- o First is "appropriations debt". From 1933 to 1959, the TVA power program was financed through direct appropriations. In 1959, when Congress changed the financing mechanism, specific provisions for repayment of this "appropriations debt" were enacted into law. These provisions require amortization of principal on a fixed, straight-line schedule (\$20 million per year), with interest set at the average Treasury borrowing rate at the beginning of each year. The unpaid balance of TVA's appropriation debt totaled \$848 million in 1984. The repayment of debt is not at issue. In fact, the Administration views the arrangement as a "model" that should be applied to the appropriations debt now owed by the five Power Marketing Administrations.
- o Second is borrowing directly from the private credit markets. In 1959, Congress authorized TVA to self-finance its power program through ratepayer revenues and borrowings backed by power revenues. TVA borrowings by law do not have the full faith and credit backing of the U.S., although its debt is generally viewed in the marketplace as having implicit Federal government backing. From 1959 to 1974, TVA borrowed \$1.8 billion from the public, \$1.7 billion of which is still outstanding. TVA debt generally enjoyed an AAA rating from the investment rating services during this period.
- o Third is FFB-financed debt. Since the establishment of the FFB in 1974, TVA has financed all new debt through this agency of the Federal government. In 1979, the debt limit was increased from \$15 billion to \$30 billion in anticipation of agency requirements for the nuclear construction program. Attached to my statement as Appendix B is additional detailed information on establishment and operation of the FFB.

TVA borrows from FFB for two programs: nuclear plant construction and an energy conservation loan program. In addition, TVA guarantees FFB loans to a private corporation (the Seven States Energy Corporation) that owns the nuclear fuel used in TVA reactors. This arrangement, where a separate corporate entity purchases and leases back fuel to a nuclear utility, is a practice used by many nuclear utilities as a mechanism to include the cost of nuclear fuel in the rate base only as it is consumed. Charges for carrying the unused inventory including interest payments on the loans used to purchase the fuel are capitalized. A detailed breakdown of FFB's holdings of TVA-related obligations is shown in Table 1 below.

TABLE 1 COMPOSITION OF TVA-RELATED FFB HOLDINGS (\$ in Millions)		
	FY 1984 New Borrowing	End of FY 1984 Outstanding Balance
Power Plant Construction....	367	13,224
Energy Conservation.....	3	261
Nuclear Fuel*.....	137	1,557
Total.....	507	15,042
* TVA-guaranteed FFB off-budget loans to the Seven States Energy Corporation, a privately-owned company that holds title to all TVA nuclear fuel.		

In the early 1980's, TVA borrowed nearly \$2 billion annually. This borrowing level has been reduced to about \$400-\$600 million per year currently as a result of the cutback in the TVA construction program from 17 to 9 reactors. But the current program is not small by any measure. For example, TVA's 1984 outstanding debt balance of \$15 billion is the fourth largest amount of obligations held by FFB, if the TVA-guaranteed loans to the Seven States Energy Corporation are included.

B. Issues

The current TVA/PFB banking relationship raises three general concerns that I believe deserve closer Congressional scrutiny:

1. Past and current subsidies to TVA power customers resulting from PFB financing, including some financing at the expense of the Federal taxpayer.
2. Potential future subsidies due to the lack of firm policy on repayment of the debt to the PFB, as well as the possible rollover of privately held debt into future PFB debt.
3. Insufficient oversight of the TVA power program.

Allow me to discuss each of these concerns in a bit more detail.

1. Past and Current Subsidies

The current TVA/PFB financing arrangement results in a large subsidy benefit to TVA ratepayers in the form of low cost debt. The low interest rates are both on TVA's own borrowing from the PFB and also on the direct loans that PFB makes to the Seven States Energy Corporation at TVA's request and with a TVA guarantee.

Subsidy Benefit to TVA

- TVA ratepayers enjoy more than a billion dollar Federal subsidy as a result of the low interest rate on Treasury borrowing compared to the cost that TVA would bear if it were selling its own debt in the market (even though PFB charges TVA one-eighth of one percentage point premium over Treasury borrowing costs).
- Since 1974, TVA has sold a total of 37 bonds to the PFB. If TVA had issued these bonds in the private credit markets, it would have had to have made additional interest payments of nearly \$5.5 billion over the life of these bonds, assuming that, based on TVA's financial condition, the debt was rated AA. The present value of this subsidy is \$1.3 billion. Attached to my statement as Appendix C is a detailed breakdown of this debt and the estimated subsidy.
- Not only do TVA ratepayers enjoy a Federal subsidy relative to private investor-owned utilities, they also enjoy favored treatment relative to customers of Bonneville Power Administration, the other major Federal electricity distributor.

- o Bonneville's financing arrangements with the Treasury were reformed by Congress effective in 1977, requiring Bonneville to pay a "market equivalent rate" of interest for Treasury borrowing.⁸ These changes required that the bond terms and conditions be similar to current financing practices of the utility industry, and that interest rates be comparable to the rates prevailing in the market for similar bonds. If these same reforms had been applied to TVA in 1974, its ratepayers would have ended up owing the Treasury additional interest payments totalling \$834 million on a present value basis over the life of the bonds.
- The TVA-related Seven States Energy Corporation enjoys similar subsidized financing. As a result, TVA nuclear fuel charges are lower than what other nuclear utilities must pay.
- In addition, for the Seven States Energy Corporation, a five-to-ten year fuel inventory has been financed for years with 90 day paper, which, in turn, is financed by Treasury borrowing that averages several years maturity. The mismatch between the 90-day maturity of Seven States' borrowing and the several years' maturity of Treasury borrowing adds to the subsidy, because interest rates are usually higher on longer-term maturities.

Effect of TVA Borrowing Activities on the Budget

- The FFB loan disbursements to the Seven States Energy Corporation and the TVA outlays financed with borrowing add to the Federal budget deficits in the near term because these disbursements are direct Federal outlays.
- Over the past five years, 1980-84, the deficit impact of TVA financing was \$7.9 billion through its own borrowing and the loans that FFB made at its request to the Seven States Energy Corporation.

⁸ The Bonneville reforms, enacted in the Columbia River Transmission Act of 1974, applied only to new debt for transmission construction and energy conservation projects. These requirements did not apply retroactively to outstanding debt, nor did they apply to debt for hydroelectric generation facilities. The President's 1986 Budget proposed repayment reform of these latter two categories of Bonneville (and other PMA) debt.

-- Based on the TVA's April Update estimates, over the next five years TVA is scheduled to continue borrowing at a rate that exceeds projected revenues generated for repayment. This will result in a net deficit increase of \$965 million rather than the net deficit decrease of \$125 million proposed in the February budget.

2. Potential Future Subsidies if TVA Debt is Not Promptly Retired

TVA borrowings from the public and from PFB are only beginning to reach maturity. In future years, substantial amounts of TVA debt will reach maturity, as shown in Table 2. There are two concerns regarding this maturing debt. They are that instead of paying off debt through ratepayer revenues:

- A. TVA may seek to rollover its PFB obligations as they come due, thereby depriving the Treasury of anticipated repayments, and in effect adding to the deficit and the national debt.
- B. TVA may seek to refinance its privately-held debt with new PFB debt, likewise adding to the budget deficit and national debt.

TABLE 2
MATURING TVA DEBT
(\$ in Millions)

Calendar Year	Amount		
	Private	PFB	Total
1986.....	50	--	50
1987.....	45	500	545
1988.....	--	200	200
1989.....	--	500	500
1990.....	--	200	200
1991-2000.....	1,590	600	2,180
2001-2010.....	--	5,800	5,800

Let me elaborate on these two concerns.

Rollover of TVA Debt to FFB

- If the TVA debt to FFB is repaid with ratepayer revenues as it matures, future budget deficits would be reduced by the amounts of additional revenue raised for this purpose.
- However, under the current arrangement with FFB, TVA could simply roll over this debt.
- The TVA statutory debt ceiling of \$30 billion was established at the time of TVA's planned 17 reactor nuclear power program. As you know, the retrenchment of the nuclear program to 9 reactors makes this debt ceiling substantially greater than necessary for current capital investment plans. Thus, this authorization runs the danger of abuse, in that TVA can use this excess borrowing authority for purposes other than building nuclear power plants, such as rolling over its FFB debt.
- Thus, should it decide to do so, TVA could act so as to increase future budget deficits.

Refinancing of Privately-held Debt

- Under current law and FFB financial practices, there is nothing to prevent TVA from borrowing additional amounts from FFB (as a substitute for ratepayer revenues) in order to repay maturing privately-held debt.
- This refinancing, in place of additional ratepayer revenues, could eventually add another \$1.7 billion to the cumulative Federal deficit.

I must point out that these additions to the deficit are not inevitable. They are potential problems. The final outcome will depend upon decisions by the TVA Board of Directors. But the key point is that this is entirely a one-sided arrangement in which the U.S. Treasury and the FFB exercise no control over the retirement of maturing FFB debt or the refinancing of privately held debt.

3. The Underlying Problem is Inadequate Oversight Relative to that of Other Utilities

- TVA enjoys automatic approval of its requests to borrow funds. This easy access to money occurs without any of the credit reviews that would normally be applied in the private market. This blank check policy leaves TVA vulnerable to judgmental errors that could ultimately result in the necessity of refinancing debt or seeking Congressional assistance in restructuring it.
- TVA also pays no commitment fee on TVA guaranteed loans made by FFB to the Seven States Energy Corporation. Accepted private market practice is to charge one-half of one percent on the undrawn balance on a loan agreement. TVA has paid nothing on its \$2 billion loan guarantee agreement with the FFB since reaching that agreement in 1979.
- TVA's financial performance in recent years does not justify the risk-free, blank check banking relationship it currently has with the FFB.
 - o Table 3 shows a comparison of key financial ratios between TVA and utility industry averages. These ratios are normally used by the investment community to judge the quality of new debt issues.
 - o The table shows that TVA is below the industry norm in several key areas. Given TVA's special status with the FFB, this might be expected; however, these differences should be noted.
 - The current ratio, which is the ratio of current assets to current liabilities, demonstrates a firm's ability to cover short term liabilities. For TVA, this ratio is .8 versus a 1.1 to 2.7 range for the industry.
 - The ratio of assets to revenues shows the efficiency with which a utility is employing its assets. Lower ratio values indicate that assets are being used more efficiently. TVA's ratio is much higher than the utility industry average.

TABLE 3
COMPARISON OF SELECTED FINANCIAL RATIOS
BETWEEN TVA AND UTILITY INDUSTRY AVERAGES

	1982	1983	1984
<u>Current Ratio</u>			
TVA.....			
Utility Industry.....	1.1 - 2.4	1.1 - 2.5	1.2 - 2.7
<u>Assets to Revenues</u>			
TVA.....	4.78	4.91	4.57
Utility Industry.....	1.5 - 2.8	1.5 - 2.8	1.5 - 3.1
<u>Interest Coverage</u>			
TVA.....	1.13	1.11	.70
Utility Industry.....	2.0 - 3.5	2.0 - 3.5	2.0 - 3.5
<u>Fixed Charges to Revenues</u>			
TVA.....	318	348	338
Utility Industry.....	128	128	128

1/ Dun and Bradstreet, Dun's Financial Profile.

2/ 1984 TVA Annual Report.

- Interest coverage, which is the ratio of earnings to interest charges, decreased to .7 in 1984. This means that earnings did not cover interest charges. TVA's 1984 earnings were depressed due to the decision to write off an \$800 million loss on cancelled nuclear plants. Nevertheless, the utility industry average has been 2-3 times that of TVA for each of the last three years.
- The ratio of fixed charges to revenues shows that one-third of TVA revenues are being absorbed by debt service charges thereby leaving too little flexibility to accommodate unforeseen changes in expenses or electricity demand. This is nearly three times the industry average.
- o All of these ratios indicate that TVA is operating under conditions that put upward pressure on its rates and jeopardize its ability to repay debt as it comes due.
- o In addition to these general measures of financial performance, the Grace Commission pointed out several specific operating areas where TVA could realize operating efficiencies and cost savings relative to industry averages, such as:
 - labor costs on nuclear plants, including engineering design and craft labor hours;
 - coal procurement; and
 - improved generating plant efficiency.
- o Were TVA to place an offering of new debt in private capital markets today, it is not certain that they could obtain a minimal risk AAA rating that would come closest to "risk free" FFB financing. (However, it is possible that TVA could receive an AAA rating on the basis of its implicit backing by the full faith and credit of the U.S.)
- The reasons behind TVA's performance are no doubt due to a number of factors. However, it appears the lack of vigorous oversight has contributed to this situation. For example, more vigorous oversight might have prompted TVA to respond more quickly to changes in the marketplace.

- o Miscalculations of electricity demand growth have resulted in the cancellation of eight of the 17 nuclear generating units originally planned by TVA. While this general problem occurred in a number of utilities, some critics have argued that TVA did not move fast enough or as far as it should to rein in its nuclear construction program. Stronger oversight might have helped TVA to respond faster.
- o TVA's nuclear fuel inventory is larger than necessary for prudent operations -- five years' supply (down from a ten year supply) vs. an industry target of one year's supply. Easy access to PFB money by the Seven States Energy Corporation may have contributed to this problem.

V. POTENTIAL AREAS FOR IMPROVEMENTS IN TVA/PFB FINANCING OF DEBT

I have identified several issues regarding the financing of the TVA power program. Some of these concerns are unique to TVA and its banking arrangement with PFB. Others are systemic to general PFB practices and procedures.

There are several suggestions that I would offer for improving the PFB banking relationship with TVA and other Federal programs. Several of these proposals are contained in the President's 1986 Budget. Others have been the subject of staff review and analysis within the Executive Branch, but do not represent official Administration policy. Nevertheless, they are offered here as ideas in the spirit of facilitating the Subcommittee's oversight inquiry.

The suggested financial reforms fall into three categories:

- A. Financing Arrangements: Terms and Conditions of PFB Lending;
- B. Financial Review and Oversight; and
- C. Managerial Reforms.

A. Financial Arrangements: Terms and Conditions of FFB Lending;

In terms of FFB financing arrangements, there are several opportunities for improvement.

1. Debt Repayment/Refinancing: TVA repayment of outstanding debt is of key importance. A decision on this issue may well set a precedent not only for TVA debt coming due, but also for all other agency debt held by FFB. TVA's maturing debt to FFB represents over \$13 billion of repayment to the Treasury between 1987 and 2014. This debt should be repaid when it is due.

In addition, TVA should be discouraged from refinancing its privately-financed debt with additional new debt to the FFB. TVA will have had up to 25 years to determine how its loans are to be repaid. We believe this is sufficient time to pay off the principal from charges to TVA's customers.

2. Interest Rates on New Debt to the FFB: As noted previously, the Bonneville Power Administration is permitted to borrow from the Treasury at an interest rate that is comparable to market rates. This same practice should be applied to future TVA borrowing. The subsidy now afforded TVA ratepayers is inconsistent with Congressional policy as applied to Bonneville and should be modified to a rate more closely matching market rates.
3. Revenue-financed Capital Investment: For the past few years TVA has followed a policy of utilizing revenues to finance an increasing share of capital investment. While we recognize that 100 percent revenue financing is unrealistic, we recommend that TVA continue this practice to the maximum extent possible.

B. Review and Oversight

1. General Reviews: We believe that TVA financial plans should be subjected to an increased level of oversight and review. It may also be appropriate to apply increased financial reviews to other areas of FFB lending activity. There are no specific Administration proposals in this area at this time. At the present time, GAO performs a triennial review. OMB reviews of TVA borrowing plans have occurred primarily in connection with the relatively infrequent TVA requests for increases in its debt ceiling. While these reviews have been helpful, they fall short of the type of reviews required to adequately protect the taxpayer.

2. **Debt Ceiling:** In light of the substantial change in TVA capital investment plans, it would be appropriate for Congress to review, and possibly reduce, the current TVA statutory debt ceiling of \$30 billion. This action would provide an opportunity for Congress to monitor more closely TVA's financial performance.

C. Managerial Reforms

In addition to the suggestions above that would impose new external requirements upon TVA, there are also opportunities for internal reforms in two areas:

1. **Cost Control:** The Grace Commission identified a number of areas where TVA managers can reduce construction and operation costs in the power program. Some of these reforms would result in direct and immediate savings to ratepayers through rate reductions; others could have longer term savings through reduced borrowing requirements. TVA has agreed to the bulk of the Commission's recommendations and has begun to implement them. If pursued vigorously, these recommendations could result in power program savings of at least \$16 million over the next three years.
2. **Financial Integrity:** TVA currently has an internal audit review staff but it does not have the same powers or degree of independence as exists in the Inspector General program. Although the GAO has commented favorably on the TVA internal audit program, it could be strengthened through the establishment of a formal Inspector General function.

Summary and Conclusion

I have attempted to provide the Subcommittee with an analysis of the issues related to FFB financing of the TVA power program. Several of these issues are unique to TVA and its current banking relationship with the FFB; others are systemic to general FFB practices. I have also attempted to point out areas where these financial relationships can be strengthened so as to provide greater financial discipline over TVA. This would reduce Federal taxpayer subsidies to TVA that add to the Federal budget deficit.

Although I may have been critical of certain aspects of TVA financing practices, I want to emphasize to the Subcommittee that the TVA and FFB financial practices are all consistent with current law.

In several areas -- e.g., putting the off-budget FFB loans to the Seven States Energy Corporation and other borrowers into the budget (as discussed in Appendix B) -- the Administration has made specific proposals for changes to current law and policy. In other areas, such as FFB interest rates charged to TVA, the Administration has not proposed specific changes. Some of these other potential changes would be extremely controversial. Nevertheless, I believe that these ideas merit a more detailed review by the Subcommittee.

Thank you for this opportunity to meet with you today. I would be pleased to respond to any questions you may have.

APPENDIX A

ELECTRIC UTILITY POWER GENERATION, CAPITAL INVESTMENT AND EXTERNAL FINANCING

	1/ Power Generation Billions of kwh	2/ Capital Investment \$ Billion	3/ External Financing \$ Billion
	Share of Total	Share of Total	Share of Total
<u>Federally-Financed Power Programs</u>			
Tennessee Valley Authority (TVA)....	114	1.4	0.4
	5%	3%	1%
Power Marketing Administrations (PMAs)	144	0.8	0.8
	6%	2%	3%
Rural Cooperatives...	85	3.2	3.2
	4%	7%	13%
Subtotal.....	343	5.4	4.4
	15%	12%	17%
<u>Publicly-Owned Utilities</u>			
State and Municipal Utilities & Public Districts.....	203	5.8	5.8
	9%	13%	23%
Investor-Owned Utilities (IOUs)...	1,764	34.7	15.2
	76%	75%	60%
Total.....	2,310	45.9	25.4
	100%	100%	100%

1/ 1983 total electric generation.

2/ 1984 total capital spending for generation, transmission, distribution and related improvements.

3/ 1984 new long-term financing.

NOTES TO TABLE

Power Generation

- o Total electric utility power generation for 1983. This represents gross electricity output measured at the generator terminals, minus power plant use. Source of data: Statistical Yearbook of the Electric Utility Industry (1983), published by the Edison Electric Institute.
- o Source for TVA power generation for 1983 was TVA Handbook, published by TVA in April 1985.
- o PMA power generation was calculated as the Federal agency total less the TVA portion of this generation.

Capital Investment

- o Capital spending for 1984 for electric utility generation, transmission, distribution and related investments. This includes new projects as well as additions, improvements and replacements for existing projects.
- o TVA capital spending includes power projects financed by revenues as well as those financed by borrowed funds. Source: TVA's Congressional budget submission for FY 1986.
- o PMA capital spending represents new Federal investment in the power systems of the five power marketing administrations. This includes investments made from appropriations as well as those made from borrowed funds by the Bonneville Power Administration. Source: Annual Reports published by individual PMAs as well as supplementary information provided by individual PMAs.
- o Rural cooperative's capital spending includes new REA direct loans and disbursements made under REA-guaranteed loans. Source: FY 1986 Budget Appendix.
- o Capital spending for publicly-owned utilities includes new additions and improvements for municipal electric companies, public utility districts, and similar utilities. Source: Public Power, January-February 1985, published by the American Public Power Association.

- o IOU capital spending represents planned construction spending for 1984. This level includes the Allowance for Funds Used During Construction (AFUDC), which was \$6.7 billion in 1983. Source: Financial Review, An Annual Report on the Investor-Owned Electric Utility Industry, 1983, published by the Edison Electric Institute.

External Financing

- o New long-term financing from external sources is shown for 1984.
- o TVA financing includes long term borrowings from the Federal Financing Bank (FFB). It excludes investments made from current power revenues. It also excludes \$137 million of short term borrowing by the off-budget Seven States Energy Corporation. Source: FY 1986 Budget Appendix.
- o PMA financing includes new investments paid by appropriations and borrowed funds but excludes investments made from current power revenues. Source: Annual Reports published by individual PMAs as well as supplementary information provided by individual PMAs.
- o For rural cooperatives, the table assumes new external financing is the same level as new capital investments, because Treasury financing takes place at the same time loan funds are disbursed.
- o For publicly-owned utilities, the table assumes that all new capital investments are externally financed.
- o External financing for IOU's is comprised primarily of new debt, preferred stock and common stock. It also includes funds available from dividend reinvestment and stock ownership plans. It excludes internally generated funds (e.g., retained earnings) which provided 42 percent of the IOU construction spending in 1983. Source: Financial Review, An Annual Report on the Investor-Owned Electric Utility Industry, 1983, published by the Edison Electric Institute.

APPENDIX B

FEDERAL FINANCING BANK (FFB)

Description

The Federal Financing Bank does not operate programs itself. Rather, the FFB finances other programs within the Government by purchasing their debt securities, making direct loans on their behalf, or purchasing their loan assets. FFB obtains the funds for these transactions by borrowing an equal amount from Treasury, which in turn borrows from the public. The operation of the assisted programs remains with the agencies that FFB finances.

The FFB (created by the Federal Financing Bank Act of 1973) began operation in May 1974 to serve as a vehicle for insuring the efficient financing of obligations issued, sold or guaranteed by Federal agencies. The Bank was intended to consolidate Federal agency debt management by eliminating the proliferation of separate Federal credit issues that were disrupting Treasury operations.

During the period just prior to creating the FFB, Federal credit instruments were being placed in the market at least three out of every five business days. Interest rates on many issues were unnecessarily high in part because many investors lacked knowledge about the instruments. Small size of the issues and poor timing were also contributing factors. It was apparent that consolidation and coordination of these activities could reduce administrative costs, minimize market disruptions and also result in lower interest rates. The FFB is authorized to:

- o purchase and sell any obligation which another Federal agency is empowered to issue, sell or guarantee;
- o impose terms and conditions that yield a rate of return that is not less than the current average yield on the Treasury's marketable obligations of comparable maturity; and
- o charge fees for its services that are adequate to cover all its expenses and provide for the accumulation of reasonable contingency reserves.

FFB holds three types of obligations: (1) agency debt, (2) agency assets, and (3) direct loans whose repayment to the FFB is guaranteed by an agency.

Current Status of Problems and Efforts to Reform FFB's Budgetary Treatment

The FFB has generally fulfilled the objectives. However, it was never intended to (nor does it currently) make judgments as to the need for the agency activity or the underlying quality of these obligations.

The FFB's budgetary treatment under current law has recently been of increasing concern. The problem stems from two sources: (1) certain transactions between FFB and other agencies are treated as outlays of FFB instead of the agencies whose programs are financed by FFB; and (2) FFB is off-budget under current law. These problems do not pertain to FFB's purchases of agency debt, but rather to its other types of transactions:

- o When FFB makes direct loan disbursements to the public (upon the request of an agency), these direct loans are counted as FFB outlays, not the outlays of the agency. Moreover, since FFB is off-budget under current law, the outlays are off-budget under current law.
- o When FFB buys loan assets from an agency (upon the request of the agency), these purchases are counted as FFB outlays and as offsets to the outlays of the agency that sells them. As a result, under current law this transaction effectively converts direct loans that have already been made by another agency into off-budget direct loans of the FFB.

In May 1985, these two types of obligations comprised 79 percent of total FFB holdings. Legislation introduced in the Congress in 1983 and 1984 was intended to correct these problems. In the 1986 budget, the Administration announced that it was proposing legislation to restore the complete coverage of the unified budget by shifting into the budget the FFB and the other entities that were off-budget under current law. The proposed legislation was subsequently transmitted under the title of the Unified Budget Act of 1985. In order for the 1986 budget documents to be consistent with this proposal, they treated the entities that are off-budget under current law as though they were on-budget. However, for transition purposes only, the 1986 budget charged the FFB outlays to the Treasury Department, in which FFB is organizationally located, rather than the agencies that use the FFB to finance their programs. In the 1987 budget, these transactions will be charged to the agencies instead. By these means, the Congress and the Executive will be more readily able to compare the benefits and costs of the affected Federal programs and to better understand the size of the total Federal deficit.

APPENDIX C
FEDERAL FINANCING BANK DEBT SUBSIDY TO TVA

Date Issued	Term	Amount (\$ in Millions)	FYB Rate	Market Rate	Interest Rate Subsidy	Present Value of Subsidy
1975	15 years	\$200	8.05%	9.16%	1.11	\$17
1975	25 years	100	8.70%	9.58%	.88	8
1975	13 years	200	8.35%	9.58%	1.23	17
1975	25 years	200	8.47%	9.58%	1.11	20
1975	25 years	300	8.465%	9.45%	.97	26
1976	25 years	300	8.175%	8.87%	.70	20
1976	25 years	400	7.97%	8.31%	.34	14
1976	25 years	200	7.625%	8.31%	.69	14
1977	25 years	300	7.975%	8.34%	.37	11
1977	25 years	400	7.935%	8.30%	.37	15
1977	25 years	400	.8%	8.24%	.24	18
1977	25 years	400	8.375%	9.35%	.98	17
1978	25 years	400	9.296%	9.66%	.36	11
1979	10 years	500	9.155%	9.84%	.69	17
1979	8 years	500	9.195%	9.83%	.64	26
1979	25 years	500	10.545%	11.63%	1.09	33
1979	25 years	400	11.225%	13.53%	2.31	77
1980	25 years	500	12.955%	13.53%	.58	19
1980	25 years	500	10.475%	12.29%	1.82	66
1980	25 years	500	10.890%	12.56%	1.67	60
1980	25 years	500	12.425%	14.20%	1.78	56
1981	30 years	500	12.735%	15.04%	2.31	79
1981	30 years	500	12.925%	16.16%	3.24	91
1981	30 years	500	13.255%	17.03%	3.78	101
1981	30 years	300	14.905%	17.03%	2.13	34
1981	30 years	650	13.035%	16.76%	3.73	132
1982	30 years	700	13.565%	16.17%	2.61	103
1982	30 years	300	13.575%	16.17%	2.60	44
1982	30 years	350	14.125%	15.02%	.90	19
1982	30 years	100	11.945%	15.02%	3.08	19
1982	30 years	200	10.725%	12.54%	1.82	26
1983	30 years	150	10.575%	12.23%	1.66	19
1983	30 years	150	10.575%	12.23%	1.66	19
1983	30 years	100	10.425%	11.77%	1.35	10
1983	30 years	250	11.685%	12.82%	1.14	20
1983	30 years	150	11.905%	12.88%	.98	10
1984	30 years	100	12.055%	12.88%	.83	6
Total.....		12,800				1,796



EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

September 24, 1985

Honorable Gordon J. Humphrey
Chairman
Subcommittee on Regional and
Community Development
United States Senate
Washington, D.C. 20510

Dear Mr. Chairman:

Enclosed are the responses to follow-up questions you and Senator Burdick forwarded to me concerning the Tennessee Valley Authority testimony presented before your Subcommittee on July 30, 1985. It was indeed a pleasure to appear before your Committee and offer the views of the Office of Management and Budget on TVA's power program. I hope these responses will further assist you in your deliberations concerning the TVA program and the issues that must now be addressed.

If I or my staff can be of help in the future, please let us know.

Sincerely,

A handwritten signature in cursive script, reading "M. Kathryn Eickhoff", is written over the typed name.

M. Kathryn Eickhoff
Associate Director
for Economic Policy

Enclosure

QUESTIONS FROM SENATOR HUMPHREY

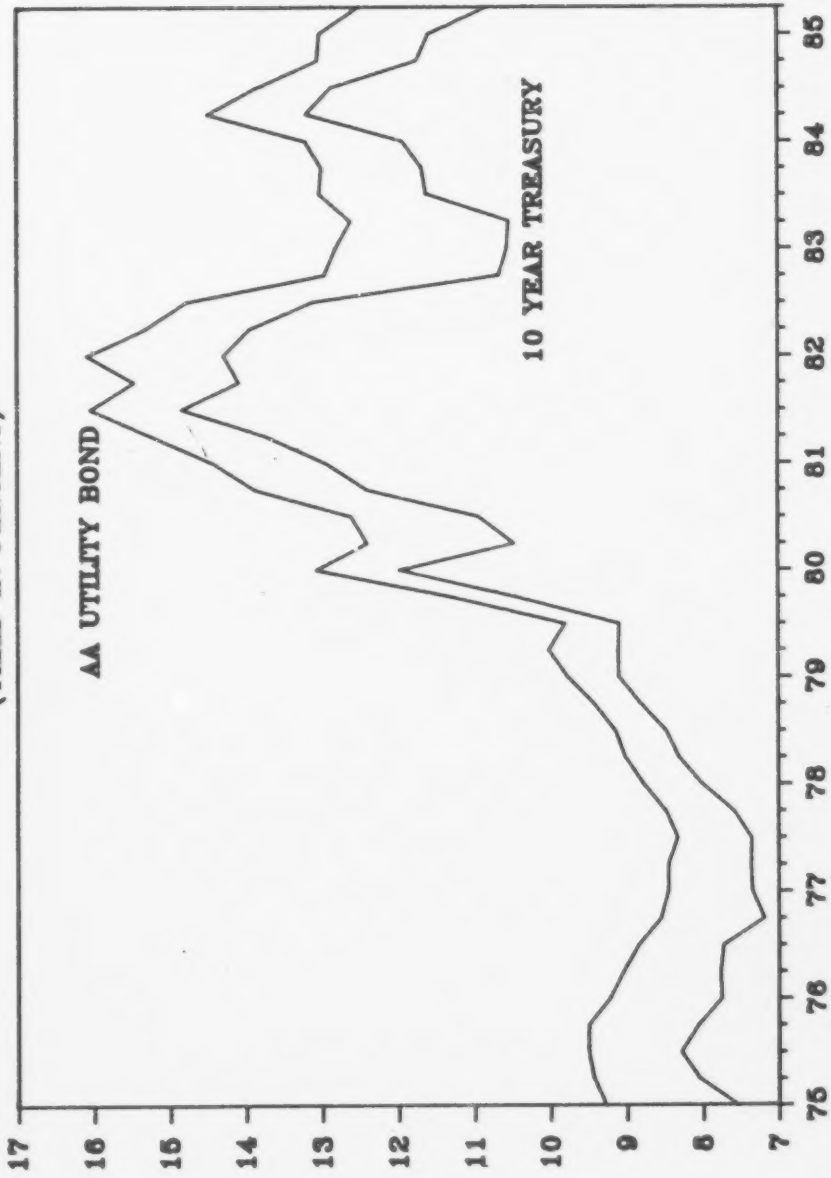
Question 1A: In your statement, you have identified subsidies which accrue to TVA through its financing arrangement with the Federal Financing Bank. TVA says that they will repay their obligation to the FFB. Assuming they do, why then is this subsidization important?

Answer: The subsidies mentioned in my statement are the additional amounts of money that TVA would have to pay if it were borrowing as a private utility without any special relationship to the Federal Government. Even if TVA repays its obligations to the FFB -- and does so without borrowing new funds from the FFB to pay off its debt -- it will have paid considerably less for its borrowing than privately owned utilities would have had to pay.

In my testimony, in order to be conservative in estimating subsidies, it was assumed that TVA would be ranked as an AA utility even though, as my testimony showed, many of TVA's financial ratios are worse than those of a typical AA utility. The attached chart illustrates the higher yields other borrowers have paid by showing the spreads above Treasury yields for an AA-ranked borrower.

The subsidies derived from lower interest rates are important because they indicate both the benefits to TVA and the costs to nonsubsidized borrowers of TVA's activities. TVA borrowing at Government interest rates raises the cost of credit to other borrowers and can be expected to reduce the amount of credit available to them.

SELECTED INTEREST RATES (YIELD IN PERCENT)



Question 18: How would TVA be different had there been no such relationship with the FFB?

Answer: If there were no relationship with the FFB, TVA would have borrowed from the private financial markets. If TVA were evaluated on its own merits, without the special status of a Federal agency, it would certainly be ranked as less than AAA. For purposes of my testimony, we have conservatively assumed that TVA could receive an AA rating. As can be inferred from the previous chart, AA utilities pay interest rates that range from 60 to more than 200 basis points above Treasury securities of similar maturities.

Over the period shown on the chart, the average AA bond yielded approximately 130 basis points above Treasuries. The FFB charges a premium above Treasury yields of 1/8 percent (12.5 basis points), so the net benefit to TVA of using the FFB is around 115 basis points. For every \$100 million of borrowing, the average annual benefit to TVA of using the FFB is roughly \$1.15 million. As of June 30, 1985, TVA had borrowed \$14.7 billion from FFB, so the annual savings to TVA of using FFB rather than the market are around \$170 million.

Question #2: What are TVA's plans for repayment of its debt over the next five years?

Answer: TVA has not provided OMB with detailed plans for repayment of its debt. TVA's most recent public comments on debt repayment reflect an intent to keep its options open. Their recent reply to a question similar to yours was as follows:

"Currently, revenues resulting from depreciation are averaging approximately \$284 million annually and are expected to increase substantially as additional nuclear plants come on line. TVA's bond covenants require that power proceeds in the amount of such depreciation be used for investment in plant or to reduce capital obligations. Should additional growth in the future require these depreciation amounts to be invested in additional power facilities, outstanding debt would be rolled over. If depreciation amounts exceed the new capital needs, debt will be retired as it comes due."

Question #3: In your assessment, has TVA taken proper and prudent steps to prepare for the repayment of its debt to the Federal Treasury?

Answer: It is unclear whether TVA has taken such steps since it has not provided OMB with a specific plan for the retirement of debt. The TVA statement (see previous question) concerning debt repayment is inconclusive and thus it is difficult to determine what TVA management may be considering. We plan to pursue this issue further during deliberations on the 1987 Budget.

Question 4: How is TVA's debt and FFB's debt reflected in the Federal Government's budget?

Answer: The TVA's activities are recorded in the Federal budget just like those of any other agency of the Federal Government. When TVA borrows to finance capital spending, the expenditure of the proceeds of its borrowing is recorded as a TVA budget outlay at the time TVA makes disbursements. This treatment applies regardless of whether TVA uses money borrowed from the public or the FFB.

Under current law, an exception to normal accounting is the FFB loans to Seven States Energy Corporation, which are made on behalf of TVA and with a TVA guarantee. FFB's loans -- of which \$1.6 billion were outstanding on June 30, 1985 -- are off-budget outlays under current law. The Administration has proposed legislation, the "Unified Budget Act of 1985" to put the FFB outlays on-budget; and the Administration plans to attribute the outlays to the agency on whose behalf the loans were made. According to this proposal, all the TVA activities would be recorded in the Federal budget and would be classified under TVA.

Before the FFB was established in 1974, the TVA borrowed from the public. This debt, classified as agency debt, was recorded as part of the Government's gross Federal debt. When TVA borrows from the FFB, however, FFB finances this transaction by borrowing from Treasury and, in turn, Treasury borrows from the public. It is this Treasury debt (also called public debt) that is included in gross Federal debt. The TVA debt to the FFB and the FFB debt to Treasury are excluded from gross Federal debt in order to avoid double counting.

Whether included or excluded from gross Federal debt, the TVA debt is subject to a special statutory ceiling. The ceiling was set at \$750 million in 1959, when TVA was first authorized to borrow; after several increases, it was raised to \$30 billion in 1979 in anticipation of the nuclear construction program. Borrowing under this authority may be from either the public or the FFB. TVA debt is not subject to the general statutory limitation on Federal debt, but Treasury borrowing to finance the FFB (including Treasury borrowing to finance FFB's purchase of debt from TVA) is subject to this limitation. The general debt limit for all Treasury borrowing is currently \$1,823.8 billion.

Question #5: Would you please explain the concept of TVA's appropriation investment?

Answer: Until 1959, TVA capital investments were financed through direct Federal appropriations. In 1959, the TVA Act was amended to allow TVA to self-finance the power program through a combination of borrowing and revenues derived from charges for electric power sold to customers.

At that time the Congress determined that TVA should repay to the Treasury \$1 billion of the appropriations made to TVA over the years, as well as a return to the Treasury on the net outstanding appropriation investment in power facilities.

The amount of return payable during each year is based on the appropriation investment balance as of the beginning of that year and the computed average interest rate payable by the U.S. Treasury on its total marketable public obligations as of the same date. The repayment schedule calls for payment of not less than \$10 million for each of the first five years (1961-1965), \$15 million for each of the next five years (1966-1970), and \$20 million for each year thereafter until a total of \$1 billion shall have been repaid. The actual payments made for the return on investment and repayment of investment are shown on the following table.

Payments to U.S. Treasury Under 1959 Amendment
(\$ in Millions)

Fiscal Year	Return		Repayment	Total
	Rate	Amount		
1961	3.4498	41	10	51
1962	3.063	37	10	47
1963	3.285	39	10	49
1964	3.425	40	10	50
1965	3.659	43	10	53
1966	3.800	44	15	59
1967	4.134	47	15	62
1968	4.165	47	15	62
1969	4.757	53	15	68
1970	5.232	58	15	73
1971	5.986	65	20	85
1972	5.210	56	20	76
1973	5.099	54	20	74
1974	6.129	63	20	83
1975	7.030	71	20	91
1976	6.533	65	20	85
1977	6.559	16	5	21
1978	6.591	64	20	84
1979	6.4808	62	20	82
1980	7.3882	69	20	89
1981	8.592	78	20	98
1982	9.608	86	20	106
1983	12.435	109	20	129
1984	12.082	107	20	127
1985	10.850	94	20	114
Total		\$1,508	\$410	\$1,918

Question #6: Are there any other suggestions you might have for improving the TVA/FFB relationship?

Answer: No. We believe the testimony and statement covers our suggestions.

Question #7: What is the relationship between the Seven States Energy Corporation (SSEC) and the TVA?

Answer:

- The SSEC was established in 1979. It is a subsidiary of the Security Pacific National Bank, Los Angeles, California. There are 100 shares of stock outstanding, all owned by the bank. The corporation is in business for only one purpose, namely, to purchase nuclear fuel from TVA and lease it back as it is needed. The arrangement is strictly a financing/accounting mechanism which allows TVA to pay for nuclear fuel at the rate it is burned, thus avoiding up-front loading of costs into its rate base. No corporation employee ever handles the fuel; this responsibility remains with TVA, though these expenses are corporation expenses.
- Funding for SSEC operations is obtained through the FFB. The corporation qualifies for access to the FFB by virtue of TVA's guarantee to assume the liability for repayment of loans to the corporation should a default occur.
- The initial loan to purchase TVA's fuel inventory, totalled \$490 million. Additional loans since 1979 have increased the corporation's outstanding debt to \$1.556 billion. All loans have been financed with 90-day paper. To date, no debt reduction has occurred; the loans continue to be rolled over every 90 days. Debt incurred by the SSEC has covered both the cost of inventory and the capitalization of interest on the debt.

Question #8: What would be a more prudent debt ceiling limit for TVA? Would it be below \$30 billion?

Answer: It seems clear with the cutback in the nuclear construction program that the currently authorized ceiling is now excessive. Before venturing a very specific judgment on a new debt ceiling we would need to consult closely with TVA to assess its plans for debt repayment as well as capital requirements for new construction. Other factors that would affect our judgment are the frequency of adjustments to the debt ceiling vs. TVA's need for advance financial commitments for long lead time contracting for construction.

QUESTIONS FROM SENATOR BURDICK

Questions #1: Is it customary for an OMB official to testify at an oversight hearing of government agencies? How many times has OMB done so since 1981?

Answer: The Office of Management and Budget makes an effort, whenever possible and appropriate, to respond to requests made by members of Congress to testify on issues of interest to Congressional committees.

The principal representatives of OMB who testify before committees of Congress are the Director and the Deputy Director. Both of these positions require Senate confirmation. Out of the 191 times that OMB has testified before Congress, on all issues, since 1981, the Director or Deputy Director testified over 70% of the time. Regarding your specific inquiry about OMB testifying at Congressional oversight hearings, our records show that OMB has done so on 11 occasions since 1981.

On occasion and due to unusual circumstances, non-confirmed OMB officials have testified before Congressional committees. But, as I must stress, this is the exception, not the rule. My own presence before the Subcommittee on Regional and Community Development was due to the fact that OMB Director David Stockman had previously made a commitment to the Chairman of the Subcommittee, Senator Humphrey, that he or his Deputy would appear before the Subcommittee to discuss the TVA issue. Neither Mr. Stockman nor his Deputy, Mr. Joseph Wright were in a position to testify, therefore, in order to fulfill the outstanding commitment, the decision was made that I testify on this issue.

Again, OMB makes a sincere effort to respond responsibly and quickly to testimony requests made by Congressional committees. I anticipate that this practice will continue and hope OMB's comments provide better understanding of the policies this Administration strives to achieve.

Question #2: How much is TVA presently required by law to pay to the Federal Treasury on an annual basis? How much are they actually paying? If these amounts are not the same, why is there a difference?

Answer: TVA is required to make two annual payments to the Treasury. One represents a return (interest) on the \$1.3 billion appropriation investment that had been made in TVA up to 1959 when the agency was placed on a self-financing basis. The second represents an annual repayment of principal, also required as part of the 1959 TVA Act amendment that makes TVA a self-financed agency. TVA is meeting these required payments. Attached is a schedule showing TVA payments made through 1984.

Payments to U.S. Treasury Under 1959 Amendment
(\$ in Millions)

Fiscal Year	Return		Repayment	Total
	Rate	Amount		
1961	3.4494	41	10	51
1962	3.063	37	10	47
1963	3.285	39	10	49
1964	3.425	40	10	50
1965	3.659	43	10	53
1966	3.800	44	15	59
1967	4.134	47	15	62
1968	4.165	47	15	62
1969	4.757	53	15	68
1970	5.232	58	15	73
1971	5.986	65	20	85
1972	5.210	56	20	76
1973	5.099	54	20	74
1974	6.129	63	20	83
1975	7.030	71	20	91
1976	6.533	65	20	85
1977	6.559	16	5	21
1978	6.591	64	20	84
1979	6.4808	62	20	82
1980	7.3882	69	20	89
1981	8.592	78	20	98
1982	9.608	86	20	106
1983	12.435	109	20	129
1984	12.082	107	20	127
1985	10.850	94	20	114
Total		\$1,508	\$410	\$1,918

Question 3: What would happen now if TVA went to the private market to finance their power program? Would the FFB object?

Answer: If TVA were evaluated entirely on its own merits, it would certainly be ranked less than AAA. For purposes of my testimony, we have conservatively assumed that TVA could receive an AA rating, even though its financial ratios are worse than those of a typical AA utility. As an AA-ranked utility, TVA would probably pay interest rates about 115 basis points more than it is paying now.

Both the Treasury Department and OMB would object if TVA were to go to the private market rather than to the FFB for financing. It would be inefficient from a Federal debt management perspective to allow a Federal agency to finance itself in the market. It is this Administration's policy that all Federal agencies use the FFB or Treasury when they issue securities of the type ordinarily financed in the investment securities market.

Question 4: Is OMB presently trying to reform or alter other agencies' use of the FFB?

Answer: Our primary concern with the TVA with regard to borrowing from any source -- Treasury, the FFB, or the public -- is that TVA be operated in a financially sound manner and not be a burden on the general taxpayer for costs that are appropriately financed from user charges. It is because of TVA's size, independence, and lack of market scrutiny, tied in with its questionable capital financing program, that we are concerned with its financial soundness. While we are also studying the financial condition of other Federal entities, TVA is the subject of great concern.

The Administration has also proposed generic legislation, the "Unified Budget Act of 1985", that would put on-budget all Federal entities that are currently off-budget. This will be a significant reform that will provide Congress and the public with a more complete and accurate picture of Federal spending, including TVA's use of the FFB to finance the Seven States Energy Corporation. The proposed legislation will not affect the budgetary presentation of TVA spending financed by debt sold to the FFB. One significant clause of this legislation would prevent Federal agencies from bypassing the FFB by financing their programs through issuing, selling, or guaranteeing obligations of the type ordinarily financed in the investment securities market.

Question 5: How does TVA borrowing from the FFB affect the Federal deficit in the long term?

Answer: TVA's borrowing affects the Federal deficit indirectly because TVA's expenditures are financed by the FFB. The TVA's activities are recorded in the Federal budget just like those of any other agency of the Federal Government. When TVA borrows to finance capital spending, the expenditure of the proceeds of its borrowing is recorded as a TVA budget outlay at the time TVA makes disbursements. This treatment applies regardless of whether TVA uses money borrowed from the public or the FFB.

Under current law, an exception to normal accounting is the FFB loans to Seven States Energy Corporation, which are made on behalf of TVA and with a TVA guarantee. FFB's loans -- of which \$1.6 billion were outstanding on June 30, 1985 -- are off-budget outlays under current law. The Administration has proposed legislation, the "Unified Budget Act of 1985" to put the FFB outlays on-budget; and the Administration plans to attribute the outlays to the agency on whose behalf the loans were made. According to this proposal, all the TVA activities would be recorded in the Federal budget and would be classified under TVA.

TVA could add to the Federal deficit if it does not collect enough revenue from its ratepayers to retire the existing FFB debt. We are concerned this will take place if TVA borrows new funds from the FFB to pay back maturing FFB loans. In this case, the Federal deficit will be larger than anticipated due to the shortfall in TVA revenues that would otherwise be used to repay the FFB.

Question #6: You mention in your testimony that TVA's internal audit and review staff could be strengthened by the establishment of a formal Inspector General. What evidence is there that that function needs to be strengthened?

Answer: We noted in our testimony that TVA's Board of Directors is a working Board. As such, they are really a part of management. This tends to undercut the audit function because if internal audit disagrees with some action of the Board, they have no one to report to. The addition of a true Inspector General function would allow reporting not only to the Board, but also to the Congress and the President. And this could be a major benefit to TVA's management and the ratepayers by promoting independence and credibility in audits, investigations and inspections.

Question 7: You stated during the hearing that TVA's borrowing from the FFB results in higher interest rates for others in the marketplace who are in effect being squeezed out by this borrowing. If FFB rates more closely reflected market rates, or TVA was forced to go to the market for its borrowing, wouldn't TVA in effect be squeezing others in the market just the same?

Answer: If TVA borrowed the same amount in the market that it is borrowing from the FFB, the market "squeeze" would be the same. However, if TVA's access to the market were truly evenhanded and competitive, it would pay market rates -- a rate based on TVA standing alone, without the special status of a Federal agency. In this case, the financial market would evaluate TVA exactly as it would any other utility. The higher interest rates paid by TVA would cause it to reduce the level of funds that it was borrowing due to a more careful hushanding of its capital base, higher internal financing, and a smaller need for capital as a result of higher electricity rates. This would make more credit at a lower interest rate available to other potential borrowers in the market.

Question #8: If TVA's financial ratios are as poor as you suggest, how is it that their power rates remain so favorable relative to other utilities in the country?

Answer: TVA's low rates are fundamentally due to the fact that its power system is heavily based on low cost generating resources. In addition, TVA has been able to maintain rates through a variety of financial factors, including:

- 1) TVA's cost of borrowing is lower than most utilities as a result of its access to FFB financing.
- 2) It appears that over the past several years TVA has sought to trade off the need for rate increases (even though there have been several) against financial performance (financial ratios have declined over the past decade). In other words, TVA seems to have sacrificed some of its financial condition to hold rates at a level lower than is required to maintain good financial ratios.
- 3) TVA has not had to make any major debt repayment in recent years. However, as was noted in the testimony, major amounts of debt will be coming due in the near future. We are concerned about TVA plans for reducing outstanding debt.

Question #9: Has OMB calculated what effect the elimination of the present interest rate advantage might have on TVA's power rates? If so, please elaborate.

Answer: OMB has not prepared a detailed analysis of the effects of eliminating the present interest rate advantage on TVA power rates. If such an analysis were undertaken, it would show that the effect on rates would vary each year on the basis of debt added to or subtracted from the outstanding balance. With this in mind, however, one can determine the change in power rates for any one year. To illustrate, using 1984 as an example, the interest rate advantage to TVA in 1984 alone is estimated to total \$155 million on the basis of \$13.5 billion in debt outstanding that year. (A rate increase to cover this amount would not, of course, recover the interest subsidy already enjoyed by TVA in years prior to 1984.) Thus, without separating out commercial, industrial and residential rates, a simple approach is to divide the \$155 million by the billions of kilowatt hours (kWh) of electricity sold during 1984. This results in a 1.4 mill increase per kWh or an increase of 3.46 percent. The computation is as follows:

$$\frac{155,000,000 \text{ dollars}}{109,026,000,000 \text{ kWh}} = 1.4 \text{ mills/kWh}$$

$$\frac{1.4 \text{ mills}}{40.4 \text{ mills}^*} = 3.46\%$$

*40.4 mills is the average price per kWh charged by TVA during 1984.

THE FUTURE OF TVA

Statement of
William U. Chandler*

BEFORE THE SUBCOMMITTEE ON REGIONAL AND COMMUNITY DEVELOPMENT
ENVIRONMENT AND PUBLIC WORKS COMMITTEE
U.S. SENATE

July 30, 1985

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THE FUTURE OF TVA

by

William U. Chandler

Introduction

The Tennessee Valley Authority is currently the subject of two debates. The debate on TVA's power program is unique in the organization's 52 year history. For the first time, the issue is not public versus private power. Instead, the issue is TVA's accountability to the people it serves. The issue is whether the federal government should control a local utility and local resources. At bottom, the issue is fairness and efficiency in government.

The concurrent debate on proposed cuts in TVA's non-power budget recalls the 1950s when the Eisenhower Administration sought to dismantle TVA. Perhaps because these appropriated programs represent the last vestige of the "regional development" mission of TVA, the threat to them elicits an emotional outcry. But an examination of this relatively small side of TVA reveals controversial and destructive construction projects as well as popular natural and human resource programs.

The question of TVA's future has been decided to a large degree by the facts of its past. The most important of these facts is that TVA has become overwhelmingly an electric utility. (See Figure 1.) Electric power has since

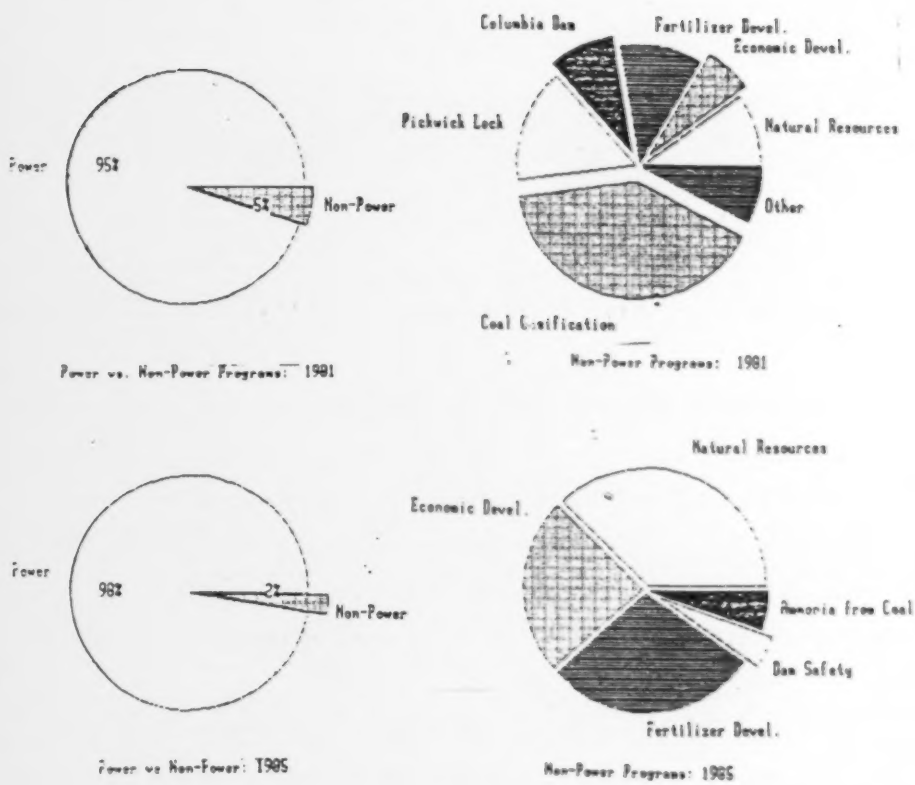


Figure 1: TVA Power vs. Non-Power Programs, 1981 and 1985
[percent of total (left) and appropriated (right) TVA budget]

the 1940s been TVA's main product, and today, over 97 percent of TVA's budget goes for electric power. Though some people may think that TVA is a federal giveaway, in reality, it is the opposite. It is paid for by the citizens of the Tennessee Valley but owned, operated, and controlled by the federal government. Any evaluation of TVA revolves around this fact. The power programs have 100 times more direct impact on the region's economy than do the "economic development programs." When TVA raises electric rates by 2 percent, it takes more money out of the region's pockets than is contributed by all of the non-power appropriated programs.

Neither blind budget-cutting nor blind defense of TVA will serve the interests of the people of the Tennessee Valley. A constructive debate will weigh unemotionally the costs and benefits of TVA and use these to evaluate the key question of TVA, that of accountability.

Accountability is a key feature of the American system, and it is an essential element of both our marketplace and our government. When a company like Coca-Cola makes a mistake, it has to face the market which then forces a correction. When politicians make mistakes, they have that day of reckoning when they face the electorate. But TVA is not accountable to the marketplace—it is a monopoly. It is not accountable to the electorate—its directors do not owe their jobs to the people they serve, and neither do the politicians who appoint them. TVA was intentionally insulated from these checks and balances. Its makers wanted it "clothed with the power of government but possessed of the flexibility and initiative of private enterprise." Its directors are appointed for 9-year terms by a president who may or may not understand the problems of the Valley, and reviewed by a Senate committee that at present does not even include a representative of the

Valley. When directors make mistakes, their jobs remain secure. If this committee notices, it has little power to correct the underlying causes of the mistakes.

TVA has been an experiment, and it has primarily tested a unique—in the United States—governmental arrangement. It has tested the merits of "technocracy," that idea of placing resources in the hands of disinterested experts. Secondly, it tested the strategy of investing in power and water transportation as engines of economic development. Any evaluation of this experiment or of TVA's future must revolve around two basic questions. The first is, Who owns and benefits from TVA? The second is, How well has this unique experiment worked? The TVA balance sheet without question includes many positive achievements, such as in the promotion of scientific agricultural practice and the efficient operation of the coal-burning power stations. But TVA's record also includes many misjudgments and much mismanagement. These faults, including environmental fiascos such as the promotion of strip mining, violation of clean air standards, as well as vast cost overruns and rate increases in the power system, call into question the argument that TVA's record justifies the extraordinary freedom TVA enjoys from the normal checks and balances we require of government. TVA may be momentarily free of these worst abuses, but its historical performance argues that citizens of the Tennessee Valley would best be served by fundamental reform of the agency.

Clearly reform is needed at TVA, but it is also clear that reform should be carefully crafted to assure that the citizens of the Valley are treated fairly and that valuable aspects of TVA are saved. The federal government's interests must also be protected, of course, but if Congress went so far as to eliminate the TVA non-power budget, it would reduce the federal deficit by

only .05 percent. A measured approach would permit time to evaluate how to correct fundamental problems of mis-management in the predominant TVA function, electric power generation.

TVA and Electric Power

TVA is owned by the federal government, but the TVA Act was amended in 1959 to require the users of TVA electricity to pay all the costs of building and operating the power system. TVA customers thus pay their own way. This is an extraordinary deal for the federal government: it owns and controls the largest utility in the country but by law accepts no financial risk for TVA. Conversely, it is an extraordinarily bad deal for the Valley ratepayers who accept all the risks but share none of the decision-making authority. All decisions with respect to power plant construction and rates are determined by the federal government's TVA board.

When TVA makes mistakes the ratepayers must bear the consequences. This would theoretically not be the case with a private utility. If a privately owned utility mismanaged the construction of a nuclear plant, the stockholders would bear much of the cost of that mismanagement and the director's would face ouster. This, in fact, was the case with the Shoreham plant in New York where the owners of the utility will absorb \$1.35 billion in cost overruns. The owner of TVA--the federal government--bears no such risk. All the ratepayers get out of this colonial type of arrangement is a small subsidy--amounting to less than one percent of power operations costs--through lower cost financing through the Federal Financing Bank. It is a poor bargain.

The question has arisen as to whether the citizens of the Tennessee Valley received a giant windfall when the TVA was amended in 1959. At issue is whether TVA customers should have been forced to repay the U.S. Treasury more than the \$1.2 billion assessed ratepayers for the investment made in the system up to that time. Though the constant dollar value was certainly greater than the amount paid by the Valley, there are three reasons why this arrangement was reasonably fair. First, and more important, the chief beneficiary of the power system since the beginning of World War II was the federal government. In the 1950s, in fact, the government used well over half the power generated by TVA. Second, the citizens of the Valley had almost no control over the type or size of the investments made in their behalf. They might have placed higher priority on other investments, such as education, had they been spending their own money. And third, there is evidence that the federal government did not invest the funds wisely, and to the extent that it wasted money on poor investments, the government itself should bear the responsibility. In fact, the economic benefits of the water transportation and the flood control systems were negative for four decades after the creation of TVA (see below), mainly because of poor planning by the federal government. The opportunity costs of the hydropower dams were also quite high. Over a dozen TVA hydro projects were more costly than available alternatives, a fact that calls the TVA decision-making process into question. (See Figure 2.) It also suggests that the Valley citizens got no special deal in the 1959 TVA Act Amendments.

Decisions TVA made since the 1959 amendments to the TVA Act have profoundly affected the region. While the coal-fired plants have been the most efficient in the nation, TVA's over-construction and mismanagement of nuclear power plants has had a serious impact, wasting over \$5 billion. TVA

(Dams)

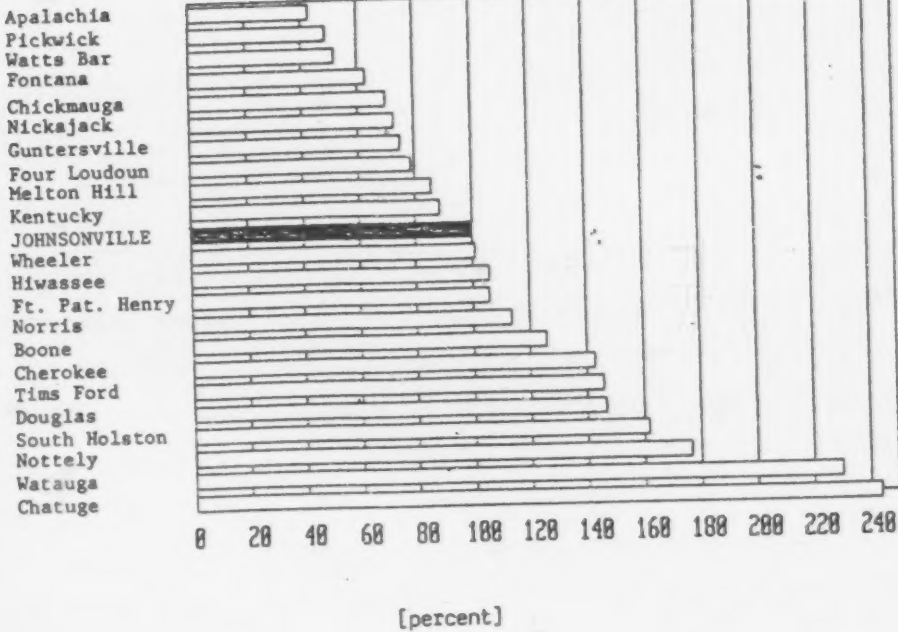


Figure 2: TVA Hydropower: A Dozen Projects Were Not Cost-Effective in Relation to Available, Low-Sulfur Coal Alternatives
 [Relative cost is indexed to 100% = Johnsonville Steam Plant (assuming low-sulfur coal). 100% = 2.43 cents/kWh in 1982 dollars]

SOURCE: William U. Chandler, The Myth of TVA: Conservation and Development in the Tennessee Valley, 1933-1983 (Cambridge, Massachusetts: Ballinger Publishing Company, 1984).

promoted electric power consumption to the extent that consumption is twice the national average. Even though rates are relatively low, the average annual residential electric bill in the TVA service area is slightly higher than the national average. The use of electric power instead of available alternatives for heating has cost the region at least \$5 billion.

Congress intentionally removed from TVA the normal checks and balances of control, but the TVA nuclear construction record illustrates the drawbacks of that decision. TVA committed itself to building "the free world's largest nuclear power system" without the oversight of any state commission, Congressional body, market competition, or even internal review. Faulty power demand projections were largely responsible for this failure. During Chairman Aubrey Wagner's era of control of TVA, power demand projections were simple extrapolations made on a part-time basis by one employee. In the absence of any oversight, TVA made immensely wasteful mistakes. Fewer than half of the seventeen nuclear reactors it ordered will be needed to satisfy power demand through the year 2000. When TVA cancelled two of these nuclear units, it lost more than twice as much money as it paid for its largest and most expensive coal-fired power plant. Interest charges alone for nuclear construction cost \$1.8 billion 1982. Browns Ferry, TVA's first nuclear plant, suffered the second most costly nuclear accident in U.S. commercial power reactor history. And now Chairman Dean himself calls the current state of affairs in TVA's nuclear system "a management crisis" due to a "brain drain." Dean attributes this drain to TVA's being tied to the federal government, specifically to federal salary limitations. The federal government, specifically the U.S. Department of Energy, has contributed substantially to the problems of the Tennessee Valley ratepayer. By contracting for more than 4,000 megawatts it will not need, the government committed TVA to build four large plants that remain as albatrosses around the ratepayers' necks. The mismanagement of the

nuclear system more than coal price increases or any other factor contributed to the doubling in real terms of TVA power rates since 1972. (See Figure 3.) The recent stability of TVA rates has been due to the cancellation of several nuclear plants under construction and the spreading of the payment of these losses over two decades, a move that traded higher costs over the long-term for short-term rate stability.

TVA reformed its power demand forecasting partly as the result of a critical U.S. General Accounting Office study in 1979, and hearings held by Sen. James Sasser speeded TVA's improvements. Demand is now forecast over a range of possibilities, with assumptions for important factors varied to permit managers to grasp the sensitivity of electric demand growth to conservation, economic growth, and other elements. TVA makes its forecasts available for public review and comment, an important reform. It must be noted, however, that the ability to comment on a plan and real power to change it--through the democratic process--are two very different things.

TVA today also takes considerable pride in its energy conservation programs, which it calls "second to none." The agency is justifiably proud of having provided energy audits for hundreds of thousands of homes. TVA innovated several important measures for delivering energy conservation services, including a "reinspection" program of retrofit work done in homes to assure that contractors had performed their work properly. TVA also provided a list of approved conservation service contractors to protect consumers. The agency's Commercial and Industrial Energy Conservation Program comprised a team of more than 30 engineering specialists who provided free energy management audits for industries. Low-interest loans were provided. The results, however, are not impressive.

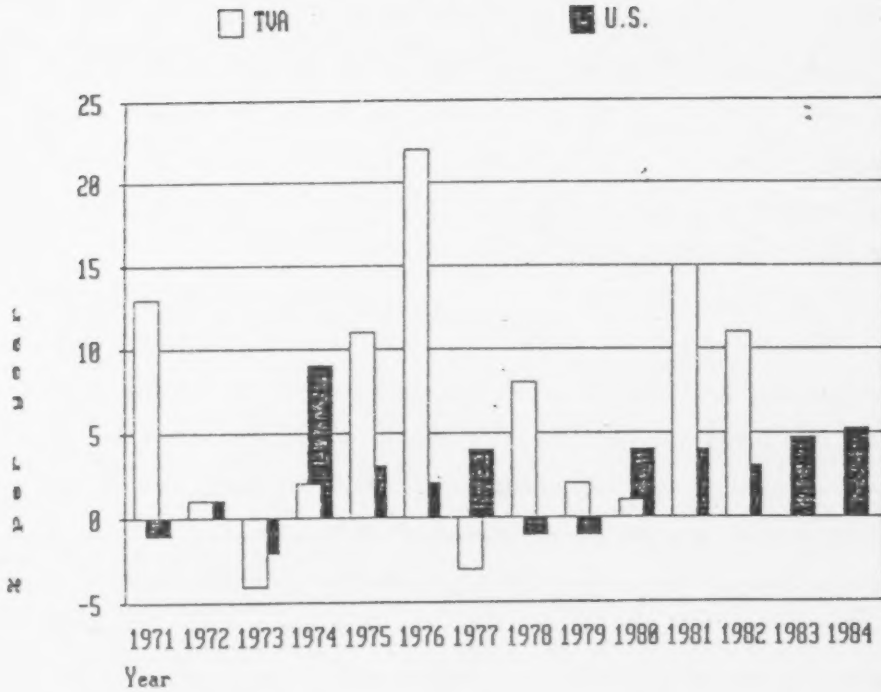


Figure 3: TVA vs. U.S. Average Residential Power Rates, 1971-1984
[Yearly increases (percent)]

SOURCE: William U. Chandler, *The Myth of TVA: Conservation and Development in the Tennessee Valley, 1933-1983* (Cambridge, Massachusetts: Ballinger Publishing Company, 1984).

The agency enjoys an absolute advantage in the magnitude of its savings because TVA is the nation's largest utility. In comparison with many other electric utilities, however, TVA ranks no better than ninth in relative performance in savings as a percent of installed capacity. (See Table 1.) TVA in 1982 estimated that it would save 12 percent of its current capacity by 1992, compared to 25 percent for Public Service Electric and Gas of New Jersey, Jersey Central, and others. The figure that TVA itself is now using for conservation savings is quite small (and considerably lower than the 1982 estimate): only about 2 percent of total power production. This achievement is further diminished by the fact that home electric consumption in the Valley is fifty percent higher than the national average. Moreover, TVA's industrial customers now have to pay over twice the cost of power that they paid when they built their plants, meaning that there should be considerable opportunity for retrofitting these plants for efficiency. Thus, the TVA energy conservation effort appears to be unambitious.

TVA's program of providing interruptible rates to large industries deserves close scrutiny. Although it is billed as a conservation or load-management program that reduces peak demand, there should be no need to shave peak demand in a utility that has almost 30 percent excess plant capacity (not counting Browns Ferry as reliable capacity, or Bellefonte or Watts Bar, which have been delayed). The policy probably should be billed as a rate-relief measure for these industries--possibly to keep them in the Valley, and should be assessed in relation to the subsidy that residential ratepayers must bear and to the environmental problems created by the promotion of electric power consumption that reduced rates encourage, especially unnecessary production of acid rain.

Table 1: TVA's 1992 Energy Conservation Plan: Relative Performance
(among largest utility conservation programs)

<u>Utility</u>	<u>Savings as a Percent of 1982 Capacity</u>
Florida Power	25
Penn Electric	25
Jersey Central	24
Pacific Gas and Electric	22
Pacific Power and Light	22
Duke Power	21
Florida Power and Light	16
Houston Light and Power	13
Tennessee Valley Authority	12
Oklahoma Gas and Electric	11
Southern California Edison	10
Alabama Power	9

SOURCE: Derived from Douglas Cogan and Susan Williams, Generating Energy Alternatives (Washington, D.C.: Investor Responsibility Research Center, 1983), and Christopher Flavin, Electricity's Future: The Shift to Efficiency and Small-Scale Power (Washington, D.C.: Worldwatch Institute, 1984).

NOTE: Utilities may have revised these estimates since the survey was conducted in 1982. TVA, for example, now plans to avoid only 2,600 MW of winter peak capacity in 1992 as a result of its conservation programs. The figure used in the above calculation, the 1982 estimate provided for the survey, was 4,000 MW.

TVA and Economic Development

TVA, almost from the beginning, chose a strategy of providing "cheap power" along with water transportation and flood control as the engines of economic growth. Interestingly, it is difficult to find quantitative evidence that this strategy accelerated economic growth in the region. The growth that occurred was experienced evenly across the Southeast, (See Figure 4) and was probably due to the growth of agricultural markets, growth of labor-intensive industries, and investments made in the health and education of people.

The evidence that the TVA region was not "saved" by the Tennessee Valley Authority comes from comparing the Valley with surrounding non-TVA areas that were just as poor and just as underdeveloped in 1933 as was the TVA region. These surrounding areas are as close as one can come to find "scientific controls" against which to measure the TVA experiment. Surprisingly, these areas performed as well or better than the region in key economic indicators. Per capita income growth in surrounding, non-TVA areas equaled or exceeded that in the TVA region, despite their being equal at the beginning of the TVA experiment. Manufacturing employment in Tennessee lagged growth in Georgia remained far behind North Carolina after more than a decade of the TVA experiment. (See Figure 5.) Rural electrification progressed more slowly in the Tennessee Valley region than in comparable surrounding areas. (See Figure 6.) The installation of piped running water in households and the utilization of home electric appliances proceeded less rapidly than in non-TVA states. (See Table 2.)

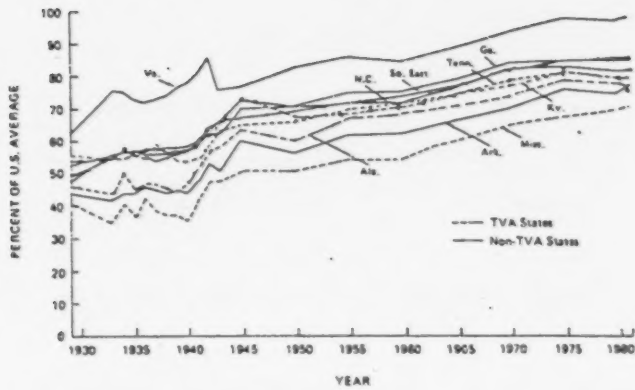


Figure 4: Per Capita Income, TVA and Non-TVA States, 1925-1983
[as a percent of U.S. average]

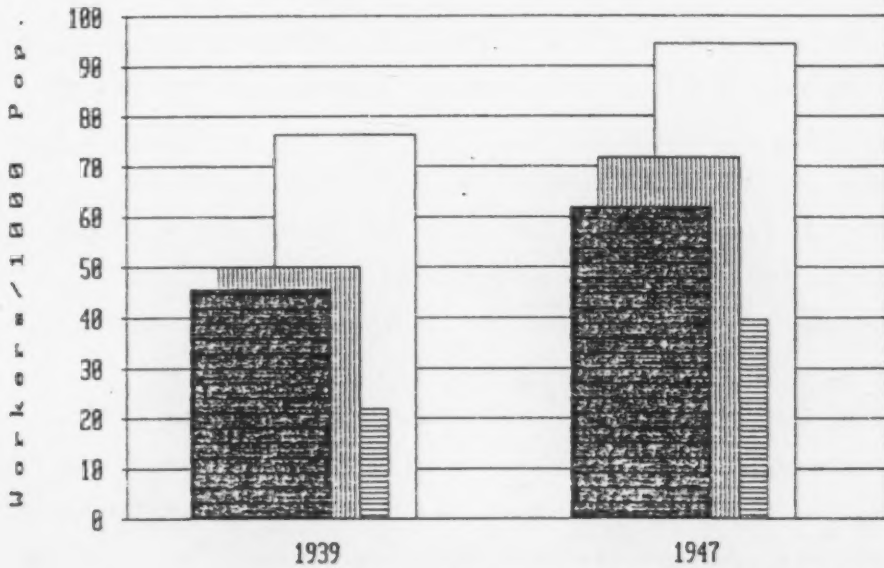


Figure 5: Manufacturing Jobs in TVA and Non-TVA Areas, 1939 and 1947

■ TN (TVA State)
▨ KY (TVA State)

▤ GA (Non-TVA State)
□ NC (Non-TVA State)

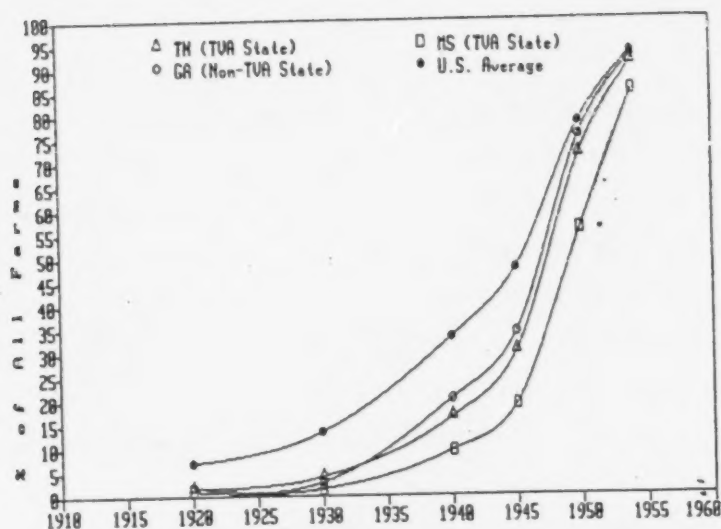


Figure 6: Rural Electrification in TVA and Non-TVA Areas, 1920-55

State/Area	Running Water			Home Freezer		Television	
	1945	1950	1954	1950	1954	1950	1954
TVA States							
Tennessee	42.6	25.2	39.9	7.5	19.4	1.5	27.1
Mississippi	40.8	25.8	34.4	8.0	19.8	1.8	16.1
Kentucky	30.4	19.9	31.6	8.4	17.5	2.7	26.5
Alabama	38.7	26.4	43.9	6.8	18.8	1.3	20.8
Non-TVA States							
Arkansas	36.8	25.3	38.1	8.7	21.1	1.8	22.3
Georgia	44.2	35.6	56.3	7.9	24.5	2.3	30.0
North Carolina	40.7	32.4	51.1	7.4	23.4	1.3	28.1
Virginia	57.8	35.6	55.0	10.2	25.6	2.5	35.0
U.S. farm average	60.2	47.9	63.2	15.4	34.6	3.2	38.2

SOURCE: U.S. Census of Agriculture, 1954.

Table 2: Piped Running Water and Appliances in TVA and Non-TVA Areas

SOURCE: William U. Chandler, *The Myth of TVA: Conservation and Development in the Tennessee Valley, 1933-1983* (Cambridge, Massachusetts: Ballinger Publishing Company, 1984).

The perception that TVA vastly accelerated the economic development of the Tennessee Valley came quite naturally from those who found employment in early TVA construction projects and from TVA itself, usually in self-defense from budget-cutters. TVA employed an average of 13,000 workers from 1934 to 1940. The economic benefit from these workers' salaries and their multiplier effects should have shown up in economic statistics. TVA analysts have published data showing, for example, that per capita income in the region increased from 44 percent of the national average in 1933 at the start of the TVA experiment to 61 percent by 1953. TVA inferred that these gains were largely attributable to TVA's investments in power generation, navigation, flood control, and fertilizer promotion. But as Figure 3 shows, there is no evidence that the existence of the unique TVA management structure made any difference in the Valley relative to surrounding areas. In certain indices, such as the number of jobs provided by industry, the TVA area lost a slight advantage it held over non-TVA areas at the beginning of the TVA experiment. These facts call into question both the strategy of investing primarily in electric power and water transportation as the basis of economic growth and the system of government that TVA represents.

Using TVA's own estimates of the economic return on its investment in the flood control and water transportation systems, it is clear they were bad uses of funds. (See Figures 7 and 8.) The flood control and navigation investments performed poorly. They failed to break even until more than forty years after they were initiated. TVA cites the revenues earned from hydroelectric power sales as evidence that the system was a good investment, but this approach misses the basic question in economics: Compared to what? Power could have been supplied with thermal generating stations such as the one TVA built at Watts Bar in 1939. A dozen of TVA's hydroelectric projects

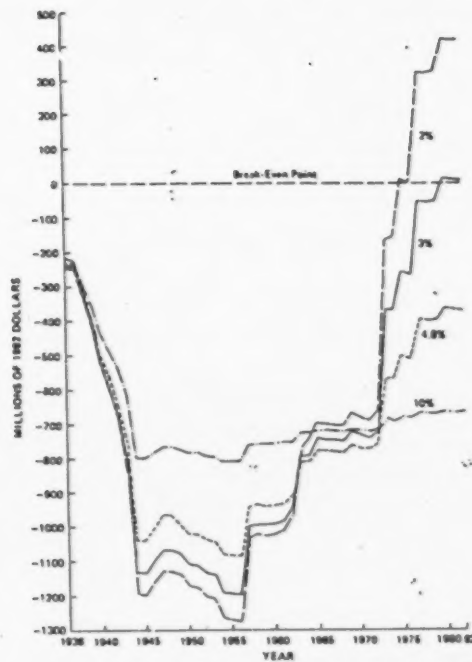


Figure 7: Net Economic Benefits of the TVA Flood Control System
[with alternative discount rates]

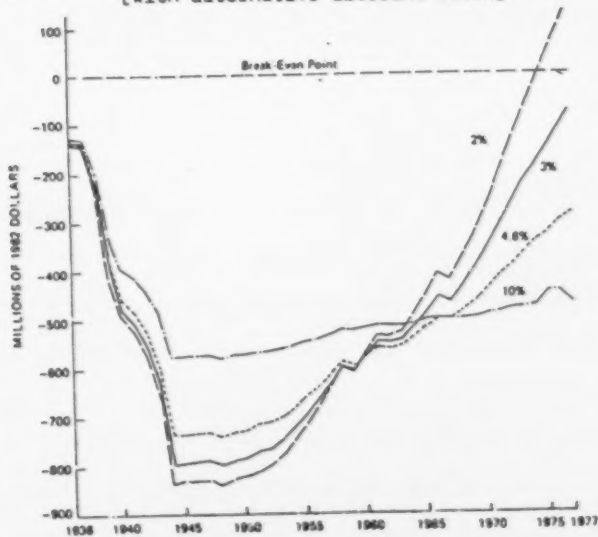


Figure 8: Net Economic Benefits of the TVA Navigation System
[with alternative discount rates]

SOURCE: William U. Chandler, The Myth of TVA: Conservation and Development in the Tennessee Valley, 1933-1983 (Cambridge, Massachusetts: Ballinger Publishing Company, 1984).

were so costly that low-sulfur, coal-fired power would have been much cheaper. As for flood control, over 85 percent of TVA's own estimates of benefits accrued to a largely industrial section of one city, Chattanooga. Yet over 3,000 families were moved to make room for Norris Dam alone to provide such protection. Clearly, there are profound questions of fairness when an all-powerful agency trades family homes for factories. Who is to say they make the right decisions? In the case of economic development, the answer seems clear enough, that the TVA made many mistakes.

TVA also made many contributions to the region as well as the nation. TVA's programs to demonstrate the use of fertilizers, crop rotation, and soil conservation serve as models for large-scale government-sponsored education programs. TVA taught farmers how to use unfamiliar but scientifically proven agricultural methods and thus altered farmers' perceptions of the risk entailed in trying new farming methods, which they feared might fail catastrophically, depriving them of their livelihood. There is still a strong need for soil erosion control efforts in the Tennessee Valley Region. (See Table 3.)

TVA's National Fertilizer Development Center claims responsibility for many breakthroughs in fertilizer production, including development of "the basic processes used to make three of today's most important fertilizers." These programs no doubt helped increase the growth of incomes through agricultural development not just across the Southeast but across the nation.

TVA thus has a mixed record. The poor long-term performance of the water power, flood control, and transportation systems may have been due to

State	Tons Per Acre Per Year
Tennessee	14.11
Missouri	10.89
Iowa	9.88
Alabama	8.88
Kentucky	8.30
North Carolina	7.58
Illinois	6.69
Georgia	6.58
New Jersey	6.36
Maryland	6.12
South Carolina	4.65
Wisconsin	3.61
Ohio	3.54
Texas	3.27
Maine	3.04
Michigan	2.35

Source: U.S. Department of Agriculture, 1980 Appraisal, Part 1, Soil, Water, and Related Resources in the United States: Status, Condition, and Trends. Washington, U.S. GPO, 1981, Table 42, pp. 159-160.

Table 3: Cropland Erosion Rates in the United States: Selected States, 1977

short-term needs and the distractions of war when the system was being built. It also may have been due to the commonly-held but mistaken view that power and water transportation are the engines of growth. Another explanation for these failures is the TVA decision-making process itself. This explanation is given more credence by TVA's gross mismanagement of coal-related environmental problems and the nuclear power system. It calls into serious question this decision-making process that excludes the parties most intimately affected by its decisions.

That TVA's development programs did not accelerate regional growth compared to the surrounding area may only mean that the development programs were tiny compared to the efforts needed to make such a change. Richard Wirtz of the University of Tennessee arrived at this conclusion when he wrote, "The money and the political support for what Morgan and others had in mind [in economic development] for TVA in the Valley simply have not been there." It may also mean that available resources--human, financial, natural--were siphoned off into "engines of progress" that soon failed.

The TVA Non-Power Capital Budget

TVA's non-power capital projects generate almost as much controversy as power rates and acid rain or stripmining. TVA has been involved in an array of such projects, including regional development schemes such as Tellico and Columbia Dams and energy demonstration efforts such as the Liquid Metal Fast Breeder Reactor and the Fluidized Bed Coal Combustion projects. In 1981, expenditures on capital items including Columbia Dam and a coal gasification plant amounted to more than 70 percent of the TVA appropriated budget. In

1985, this percentage had dropped to about 20 percent. At the same time, "operating programs" in areas of natural resources and economic development had increased both in relative and absolute terms. (See Figure 1.) Savings have occurred as the result of the completion of the infamous Tellico Project, postponement of the Columbia Dam, and mothballing of a coal gasification project. Some observers point to these changes as evidence of reform at TVA.

The selection of these projects does highlight deficiencies in the TVA decision-making process. The Tellico Dam Project, for example, illustrates both the inequity and inefficiency of the capital intensive, non-power projects that TVA undertakes for regional development. Tellico has a long and bitter history, one that teaches much about both the past and the future of the Tennessee Valley Authority. TVA completed Tellico in part for the energy it provides: TVA insisted it needed the 22 megawatts Tellico makes possible while at the same time it was cancelling 5,000 megawatts elsewhere in the system. TVA insisted it needed twice as much land as was to be flooded for industrial development, promising 40,000 jobs. But now, five years after completion, fewer than 100 jobs have been provided, none of which came as a result of the reservoir. For this, TVA condemned farms such as that of Jean Ritchey. She and her husband lost about 100 acres of prime farmland despite the fact that only 2 acres were to be flooded. Today they rent back from TVA the land that was theirs. Flood control benefits of the dam are dubious, especially since the claimed benefits from Tellico are from reduced flooding in Chattanooga, flooding that is caused primarily by water flowing from Chickamauga Creek and unchecked by the dam. Recreation, the largest supposed benefit, cannot be seriously considered, since twenty-two reservoirs exist within 60 miles of the Tellico Dam. Tellico damaged TVA's reputation; indeed, it was a loss for all. The unbelievable thing is that TVA will probably repeat the Tellico tragedy on the Duck River.

The Columbia Dam has been planned by TVA for the Duck River in Middle Tennessee. The Duck survives as the longest free-flowing stream in Tennessee, and is a scenic, biologically diverse, and productive river. The Columbia Dam project would encompass 27,000 acres and will flood 12,600 of these. Eighty-seven percent of the land to be inundated is prime farmland. More than 1,500 persons will have been dispossessed of their land and homes, and schools, churches, stores, and cemeteries will have been destroyed if the project is completed.

Columbia Dam was first proposed in 1953, but was rejected by TVA because it was considered uneconomic. The dam could provide no hydroelectric potential, no navigational benefits, and only minor flood control. Sixty percent or more of the benefits are to accrue from recreation. As with the Tellico Project, which Columbia closely resembles, many such reservoirs already exist nearby--some 160,000 acres of recreational lakes, in fact, within a 50 mile radius. An Army Corps of Engineers Analysis of the project concluded:

1. Recreation benefits from leaving the river in its natural state exceed those from the proposed reservoir;
2. Benefit/cost ratios of no better than 0.7 - 1.0 could be justified for the reservoir;
3. Water supply demands could be met through usage of the existing Normandy Reservoir;
4. Fish and wildlife would be adversely affected;
5. The loss of 11,000 acres of prime farmland would be detrimental from an economic and environmental perspective. (The Corps also noted the

flood control benefits to 8,000 acres, but this total does not exceed the area to be flooded by the reservoir.)

A committee of the U.S. House of Representatives severely criticized TVA for "minimizing the significance of staff findings" for benefits of alternatives, "deleting...benefits of alternatives...enhancing the economic attractiveness of the original project by claiming that TVA had identified a potential thermal power plant site in the Columbia reservoir area." The chairman of the committee, Rep. Toby Moffett called this and TVA's unwillingness to publicly state opinions regarding Columbia Dam as "poor government. Congress in the final analysis is only as good as the information provided it."

The current Chairman has said that "Columbia Dam is a bad project but it will be built." TVA continues to list Columbia Dam as an ongoing project and is currently conducting yet another feasibility study of the project. That the Columbia Dam project is being dusted off for reappraisal, perhaps as a favor to one or two powerful supporters, calls into question the wisdom and independence of TVA's leadership. Staffers consistently say that TVA does not want to finish the dam but that it is being forced to do so by Congress. If this is so, it demolishes the myth of TVA's having "the flexibility of a private corporation."

TVA has in recent years also wasted over \$100 million on preparation of a coal gasification plant. This plant now has been "mothballed," and is probably moribund. Projects such as this, along with Tellico and Columbia, strongly suggest that TVA's non-power capital budgets are poorly controlled. One remedy would be to require authorization of all such projects before funds

are appropriated. This would give Congress and citizens a chance to review these projects for their merits before TVA rushes into them and wastes hundreds of millions of dollars as well as the natural resources of the Valley.

TVA and the Environment

The federal presence in the Tennessee Valley has left a legacy of environmental problems. Coal stripmining, acid rain, deoxygenated water--these are problems to which TVA both directly and indirectly contributed. They are problems that were made far worse because TVA during the 1940s and 1950s supplied more than half its power to the United States government for weapons fabrication and uranium enrichment. Not only did the federal government degrade land, water, and air resources by its dam building and coal procurement and combustion practices at TVA, but it caused these problems in the course of supplying power for national security programs. It is natural, then, that Valley citizens would jealously guard the small sums of money that now are appropriated for TVA's natural resource programs to mitigate some of these problems.

A portion of TVA's budget goes for orphan stripmine reclamation. This is justifiable because TVA, through its coal purchase policies, led the nation to switch to surface mined coal. (See Figure 9.) Stripmining destroyed some 3,000 square miles of Appalachia and 10,000 miles of streams before the Federal Surface Mine Control and Reclamation Act was passed in 1977. Much of the coal TVA purchased from stripmines was burned to enrich uranium for the nation.

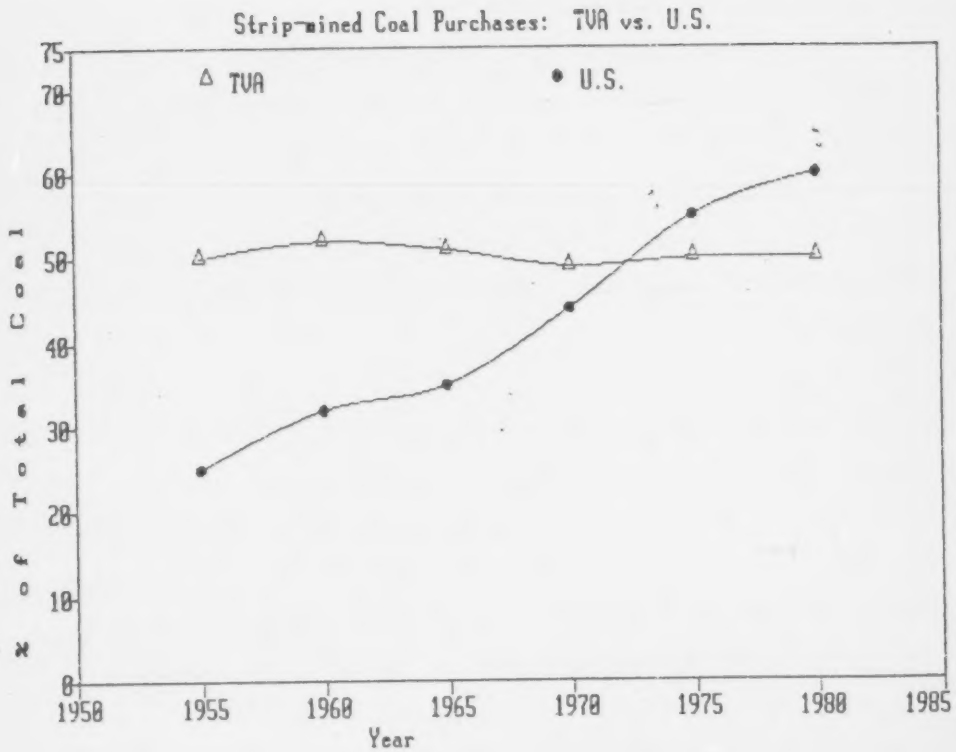


Figure 9: TVA's Promotion of Coal Stripmining

SOURCE: William U. Chandler, *The Myth of TVA: Conservation and Development in the Tennessee Valley, 1933-1983* (Cambridge, Massachusetts: Ballinger Publishing Company, 1984).

Much of the system of hydroelectric dams was built to supply power to support the war effort in the 1940s. While the benefits of this effort were clearly national, the costs were local. Almost half of the reservoir system today suffers from serious oxygen depletion, primarily as a result of thermal stratification caused by the dams themselves, but also because of water pollutants. (See Table 4.) TVA clearly has a responsibility to ameliorate this problem, and its efforts to reinject oxygen with baffles on the power turbines are commendable.

TVA became the nation's largest air polluter under Chairman Aubrey Wagner's leadership in blatant defiance of national law. TVA's recent compliance with the law was brought about by the threat of enormous fines resulting from a citizen's lawsuit. The authority's recently-stated support for the national law is commendable, though it owes the nation some repayment for the environmental damage it imposed not just on the Southeast but New England as well. For this reason, it is commendable that TVA is spending power revenues to develop clean coal combustion technology such as the Fluidized Bed combustor.

Promotional TVA power rates for large industry, however, recall how the power system can overwhelm the programs TVA conducts to improve the environment. These promotional rates could, by reducing these industries' incentive to conserve energy, encourage the consumption of electric power. The result is most likely additional consumption of coal and unnecessary addition of thousands of tons of acid-rain causing sulfur into the air each year.

Reservoir	Days per Year		
	<1 mg/l	<3 mg/l	<5 mg/l
Cherokee	64	105	147
Tims Ford	65	78	102
Douglas	27	81	119
Chatuge	14	74	103
Norris	9	64	82
Nottely	2	60	80
South Holston	2	43	93
Fontana	1	25	74
Fort Loudoun	0	8	105
Fort Patrick Henry	0	9	93
Hiwassee	0	0	62
Blue Ridge	0	1	59
Boone	0	5	54
Watauga	0	4	49
Santeelah	0	0	49
Watts Bar	0	1	45
Cheoah	0	0	29

SOURCE: "Water Quality In The Tennessee Valley—1980," Division of Water Resources, Office of Natural Resources, Tennessee Valley Authority, March, 1981, p. 52.

Table 4: Reservoirs With Critically Low Oxygen Levels

The desirability of continuing environmental programs to mitigate TVA's historic and ongoing impact on the environment suggests a continuing role for the natural resources programs. That TVA continues to seriously affect the environment through its power generation programs and what might be considered promotional power rates suggests that regulation of the utility portion might also yield important environmental benefits. The TVA record shows, however, that the most important means of protecting the environment of the Tennessee Valley is the existence and enforcement of strong federal environmental legislation, coupled with the conservation of electricity.

The Future of TVA

The TVA record has positive aspects. Some of TVA's development and demonstration programs have helped make farmers more efficient and the market to work better. It is impressive that the National Agricultural Fertilizer Development Center is now almost completely self-financing. The TVA power system has, until recently, been a model of engineering efficiency, if not of environmental protection. TVA has been remarkably free of corruption and its staff highly skilled and dedicated.

The benefits, however, do not sufficiently outweigh the costs to justify the extraordinary freedom from democratic control that TVA enjoys. To the contrary, profound mistakes that affect both the region and the nation call for reform in the TVA decision-making process. Evidence fails to support the notion that TVA really worked an economic miracle in the Valley, that the Valley prospered because of the growth of agricultural markets, the influx of

labor-intensive, relatively unskilled industrial jobs, and investments in the educational abilities of the citizenry. Evidence that the region still lags economically suggests that TVA has been less than successful. Environmental destruction caused by TVA--in stripmines, in reservoirs, in acid rain--incontrovertably points to a failure in a basic TVA mission. Gross mismanagement of the nuclear power construction program points to the need for reform.

The range of options for TVA's future is relatively small. There is always the possibility of retaining the status quo, but risk of continued mismanagement of the power system and the capital items under the appropriated budget should rule out this option. Practical options differ in complexity, and so should be judged on the basis of how well they serve to (1) restore democratic control to the TVA power system, and (2) add checks and balances to the appropriated programs. With regard to the utility portion, the options include:

- o Retaining federal control of TVA. The federal government, however, would assume the normal financial risks of ownership, including the costs incurred with power plant overconstruction and mismanagement.
- o Transferring ownership of TVA to a Valley-based co-operative owned by the TVA ratepayers, with (a) the directors directly elected; or, (b) the directors chosen by a corporate structure, with the utility regulated by the states.
- o Retaining the status quo, but permitting state regulation, or regulation by a newly created regional body.

The options for the appropriated system include:

- o Elimination of all programs but the essential day to day management of the reservoir system.
- o Retaining the appropriated programs, but requiring authorization for all appropriations.
- o Retaining the appropriated programs, but requiring measures to make them self-financing.
- o Transfer of appropriated programs to other U.S. agencies.

With a few changes in TVA's charter, TVA could continue to serve the people of the Valley. The most appropriate change would be for the federal government to deed over the TVA power system to, for example, a cooperative owned by the citizens of the Valley. It could be directed by a board elected directly, appointed by state governments, or chosen internally, as long as in the latter case the utility were regulated by the states.

The non-power portion of TVA could be reformed with a simple change that could permit it continue even with transfer of ownership of the power system. The TVA waterway and appropriated programs could continue to operate under the current managerial arrangement--with the important change that any new appropriations for capital projects would require specific authorization by Congress.

Because the question of the efficacy of the modern economic development efforts remains, the government could build into any continued appropriations a means of evaluating their performance. Some quantitative assessment of their real value by some independent analysts would be helpful.

Turning TVA's power system over to local control and requiring authorization for appropriations would solve many problems. Local control would solve the "brain drain" problem that Chairman Dean describes because it would free TVA to pay competitive salaries for its employees. It would also solve a basic problem of equity for Valley ratepayers who have to bear the burden of TVA mistakes without having any say whatsoever in how the agency is run. Local control along with authorization for the non-power programs would together solve the fundamental problem of accountability. The future of TVA, with these changes, could thus be one of greater efficiency and reduced conflict.

Responses to Questions for William U. Chandler from Senator Humphrey:

q.1. You demonstrate in your testimony that TVA's power rates have doubled since 1972, in real terms. How does this relate to the issue of accountability?

a.1. Power rates are a prime measure of TVA's performance. These rates have historically been lower because of several advantages TVA enjoys, especially its proximity to the coalfields, which cuts transportation and therefore power costs. This advantage partly explains why TVA rates were only half the national average in 1970.

But TVA lost most of this advantage between 1970 and 1982. Over this period, TVA power rates increased 100 percent in real terms while the national average increased about 40 percent. TVA's poor relative performance was due to the fact that it rushed into a program of building 17 nuclear power plants. Today, 8 have been cancelled at a loss of about \$6 billion, 4 are nearing completion even though additional capacity is not needed, and the 5 completed plants are unsafe to operate and have been shut down indefinitely.

These problems stem from the original decision to rush into construction of the 17 reactors, as well as the failure to review and alter the decision at timely intervals. Most utilities are subject to the oversight of regulatory bodies that conduct their own reviews and analyses of the need for power in order to protect their constituents' interests. TVA has no such counterbalance to its decision-making authority, however, and this is the primary flaw in the TVA Act, for it is the main cause of TVA's poor power system management.

q.2. In your testimony, you suggest that TVA's average residential bill approaches the national average despite relatively low electric rates. Why does the average resident in the Valley pay more than the national average in electric bills? What does this say about the promotion of electric power?

a.2. Former TVA Director S. David Freeman once said that Valley citizens were "...snookered into using so much electricity." Valley residents have been three times as likely as the national average to use electricity for space heating, and twice as likely to use electricity for water heating. TVA promoted the use of power with the idea that it was cheap, which it used to be compared to the national average. But natural gas and, until recently, oil, delivered the same amount of useful heat as electricity for far less cost. Thus, residents were "snookered." Several major gas supply lines pass through Tennessee. Had Valley consumers chosen natural gas over electricity, they would have saved \$4 billion between 1955 and 1982. [See Conservation and Development in the Tennessee Valley, 1933 - 83 (Cambridge, Mass.: Ballinger Publishing Company, 1984); pp. 118-23.]

q.3. Who do the people of the Tennessee Valley turn to in the wake of errors and poor decisions made by the Tennessee Valley Authority? How can this be changed?

a.3. TVA decisions are made by its three-member board. The board members are nominated by the U.S. President for 9-year, overlapping terms. Their nominations are reviewed by the Senate Environment and Public Works Committee. The only way consumers of TVA power can affect the decision-making process is to affect the choice of board members. But to do this, they must wait for an opening in the board to occur and then try to influence the President--whose staff has recently rebuffed citizens' attempts to influence the decision--or this committee--which currently contains no member from the Tennessee Valley and has little to lose if it ignores the wishes of citizens who are not constituents.

The source of change must be direct representation of the affected citizens on the Board. This requires that the directors be directly elected by Valley citizens, appointed by elected officials of the Valley, or regulated by officials who are elected by the populace or appointed by elected officials.

q.4. At the end of your testimony, you suggest that the Tennessee Valley Authority should be brought under the authorization process. Can you offer suggestions as to how this would work, what it would mean, and why it is important, particularly to the people of the Tennessee Valley?

a.4. The requirement that funding for projects be both appropriated and authorized provides a fundamental check on the power of individual legislators and appointed officials. The dual process spreads power among the various parties at interest and reduces the potential for abuse. TVA is self-authorising, however, and therefore lacks this fundamental balance of power.

Many TVA projects were bad economic investments. A dozen large dams were not cost-effective. One hundred million dollars was wasted recently on a synthetic fuels plant that was ill-conceived and finally abandoned. Tellico and Columbia Dams are undeniably abuses of the public treasury. These projects are also environmental disasters. Had these projects been subject to the scrutiny of authorising committees, they probably would not have gone forward. Thus if TVA were subject to the normal authorization process, the Valley environment--and the citizens who live with that environment--would be safer from the effects of destructive projects. Moreover, the federal treasury would be safer from abuse.

Answers to Questions for William U. Chandler from Senator Burdick

q.1. Everyone seems to agree that in many respects, TVA underwent a period of pretty profound change during the 1970's; most think that change was for the better. If TVA is the unaccountable entity that some say it is, what brought these changes about?

a.1. TVA, as I have demonstrated in The Myth of TVA: Conservation and Development in the Tennessee Valley, 1933-1983 (Cambridge, Massachusetts: Ballinger Publishing Company, 1984), is an agency virtually unaccountable to the public it serves. It remains, however, liable to the criminal and civil codes of the United States, despite the fact that in the seventies TVA argued to the Supreme Court of the United States that it did not have to obey federal clean air laws. The Supreme Court rebuffed this argument. For that reason, a coalition of citizens' groups was able to sue TVA and force it to comply with the Clean Air Act. TVA most often cites its recent compliance with this Act as evidence that it has "changed its spots," but the fact remains that change did not occur until the agency was sued. TVA's newfound willingness to comply with federal law may be considered "profound," as some say, and it is definitely a change for the better. This fact, however, does not necessarily indicate anything with respect to accountability. TVA, after all, was forced to comply with the Clean Air Act only under threat of hundreds of millions of dollars in fines.

None of this is to say that TVA does not have a greater sensibility for environmental matters--it may. But TVA cannot claim forced compliance as an indicator of change. Some people suggest that the TVA energy conservation programs are a good index of change, but there is less there than meets the eye. The programs are in no way as exciting or productive as those in place in private utilities in California and in at least 6 other utilities elsewhere in the country. TVA is now providing promotional electric rates to industry, a fact which counters the argument that TVA has changed.

q.2. What major decisions will TVA face in the foreseeable future and how would changing the Board structure of TVA or its status at (sic) a Federal agency necessarily make these decisions better?

a.2. TVA faces the problem of how to salvage some use from its \$15 billion investment in nuclear power. TVA has been incapable of managing this investment. It has cancelled capacity at a rate 3 times the national average. Even when it has completed plants, TVA has experienced far higher rates of safety violations. The better management and performance of the rest of the nation's utilities has been due in large part to the regulation of those utilities by the states, and the opportunity for public participation this regulatory process affords. By giving citizens direct input into the decision-making process, the TVA decision-making process would be improved. Taking ownership out of the hands of the federal government would not necessarily provide this input, but permitting state regulation of the utility, whoever owns it, would.

TVA must also decide which of its customers, households, industries, commercial buildings, or the federal government, will pay for its mistakes. TVA also faces the possible additional loss of large loads, including that of much of the aluminum industry in the Valley. If this occurs, ratepayers could again be subject to rapidly increasing power rates. The decision of who pays for past mistakes plus costs incurred as a result of changing economic patterns requires--in any definition of fairness--the participation of those who will be forced to pay. If TVA is changed from being an agency with no direct accountability to the affected ratepayers to one with direct accountability, its decisions will better reflect their interests. The decisions should thus be more equitable and less capricious.

The TVA-style system of government takes away from citizens control over investments that serve them alone and for which they alone must pay. It gives this authority to "experts" appointed by officials elected by persons other than the locals. No American would dream of taking away from local citizens the power to select school-board members and to turn it over to experts appointed from the outside. (Some federal involvement, such as in Civil Rights, is required to protect the rights of minorities, just as it is in the operation of local utilities to protect the environment.) The Senator's question, however, implies that just this practice is justified, that the Valley's citizens cannot govern themselves.

q.3. During the course of the hearings, there was much talk about the needs and wants of the Valley's citizens. To your knowledge, has there ever been a case where a clear majority of the Valley citizens have wanted TVA

to do or not do something (besides lower the power rates) and TVA has failed to respond favorably? If so, please explain.

- a.3. This question reflects common confusion regarding the nature of TVA. It asks one to ignore a fundamental index of TVA performance, power rates, in the sole area in which TVA should be uniquely accountable to Valley citizens. Where Valley citizens alone pay the costs of service, TVA should be accountable to them. Where the nation as a whole pays the costs, TVA should be accountable to the nation as a whole. Valley residents alone pay the costs of the power programs. The nation shares the cost of appropriated programs. Thus, if you eliminate power from consideration in this question, you ask a meaningless question. This is doubly so because the power program consumes over 95 percent of the TVA budget.

Moreover, it is clear that people of the Valley support protection of the environment. The clear majority, if asked, would not have approved of the devastation of the Cumberland Mountains with TVA-encouraged stripmining. Elected representatives of the Valley—including Senator Howard Baker—voted to control this practice. They also voted to protect the nation's waters from precisely the kind of water pollution caused by TVA reservoirs. They voted to clean up the nation's air, yet TVA became the nation's largest violator of the Clean Air Act. They voted to preserve endangered species, yet TVA's poor record there is well known. Thus, there are many such instances where TVA has acted contrary to popular sentiment.

q.4. During the hearing, Richard Ayres pointed out that the agreement which was reached regarding TVA's cleaning up its power plant emissions was stalled for two years by the co-ops who wanted to weaken it. This would seem to indicate that there could be a "down-side" to further opening up the TVA decision-making process to the general public. Could you please comment?

a.4. Simply converting TVA to a locally-owned co-op would not be sufficient. Co-ops all over the nation have demonstrated their lack of accountability, as demonstrated in the Environmental Policy Institute book, Lines Across the Land, written by Jack Doyle. Citizens in Colorado recently fought to preserve state regulation of co-ops there. Citizens in the Northern Great Plains are fighting to gain regulation of co-ops there. TVA, whether converted to a co-op or not, should be made directly accountable to the Valley electorate.

q.5. In a related vein, how does your claim that TVA is relatively unaccountable, (sic) account for the fact that TVA, unlike any other utility in the United States (sic) has come out in support of acid rain legislation and is a leader in many other environmental areas?

a.5. That TVA supports the resolution of a single issue neither proves nor disproves its accountability. Likewise, the good luck of having a current board with good judgment--as opposed to having one that defied the law, as was the case not long ago--is not guaranteed. Who is to say what the new director who replaces Richard Freeman will think about clean air? What can any Valley citizen--or anyone else for that matter--do

about it if the new director turns out to oppose air pollution control? Now, the President may decide to avoid a conflict with this Committee's chairman, because the chairman supports clean air. But because he and the other members of this committee hail from outside the Valley, there is nothing Valley citizens can say about it if this committee decides to approve a clean air opponent. What your constituents might do about it is another--but, insofar as the Tennessee Valley is concerned, irrelevant--matter.

q.6. You state in your testimony that if Congressional pressure to build Columbia Dam is what is keeping it alive, then the myth of TVA's having the flexibility of a private corporation is demolished. Columbia Dam was of course being built out of TVA's appropriated accounts. Does similar Congressional pressure affect TVA's power program, or is it more independent.

a.6 My testimony with regard to TVA's power program states that it is accountable neither to government nor the marketplace. My point regarding Columbia Dam was that TVA cannot simultaneously claim two mutually exclusive conditions: 1) That self-authorization of appropriated programs gives it the freedom of a corporation, and, 2) That the agency only continues Columbia Dam because it is bound by Congress to do so. TVA cannot be both free to cancel Columbia and bound by Congress to finish it. If TVA is free to cancel a project that it finds a waste of money but does not cancel that project, then it does not deserve its freedom. If TVA is bound to finish the project because the appropriations committees require it to, then the power of these committees needs to be checked and balanced by the authorization process. In either case, the myth is demolished.

Testimony of Richard A. Couto, Senior Research Associate
 Vanderbilt University Institute for Public Policy Studies
 Before the
 Subcommittee on Regional and Community Development
 United States Senate Committee on Environment and Public
 Works
 July 30, 1985

TVA embodies a unique set of American political beliefs some of which are controversial. In this sense, TVA is an experiment and it has been controversial because of its unique set of principles. TVA is also controversial because of the inevitable disparity between any set of principles and the practice of them. In any discussion of TVA it is useful to distinguish those controversies over the principles of TVA and those controversies over its practices. My testimony will review the principles of government that TVA embodies. Second, I will review some of the practices of TVA in the recent past. These will include present forms of accountability in TVA and the problems with them; recent efforts of reform in the TVA including new forms of accountability; and some suggestions for additional reform in TVA.

If one examines books, articles and statements about TVA in the first decade of its work, one will find a consensus on the following beliefs among TVA advocates. First, government is capable of positive action on behalf of people and should undertake some tasks which exceed the ability of people to do for themselves. Second, government action on behalf of people should begin with the worst situation first. Third, government action on behalf of people should be sensitive to the needs and values of the people involved and should involve the people effected by government action in the planning and implementation of that action. This came to be known as grass roots administration. Fourth, redistributive policies by which those who enjoy excess wealth and political influence share a portion of what they have with those who have less than they need are appropriate. There was also a consensus that the development of human and natural resources are related.

These principles are in vogue and popular at some times and anathema and unpopular at other times. In this sense, TVA serves as a reflection of American political attitudes. TVA has adjusted its practices from time to time to adjust to the views of its friends and its foes and to the changed emphasis in American political attitudes. At all times however, TVA reflects back to the American people an image of themselves and who they think they ought to be. In

recent years that image has been tarnished by the practice of TVA and has been satisfactory to very few people.

But even this tarnished image of TVA is a reflection of what we wanted. TVA's pursuit of cheap electrical power in the 1950s set it on a course that exploited a depressed coal economy and hastened environmental and socially destructive practices in the production of coal. TVA pursued those policies in part to show Congress and the administration at that time that it was a free market operation and not a form of creeping socialism. Throughout the 1960s and 1970s the clearest signal that TVA received from Congress was to keep rates down and this encouraged TVA to continue environmental and social subsidies in the production and use of coal including sulfur laden emissions from its plants. When criticisms of these practices increased, TVA moved to a total nuclear program as the course to cheapest rates and of least resistance. TVA's nuclear commitment involved it in an escalating market for capital and an evolving energy form of escalating prices.

The point is that TVA pursued some of the practices for which it is criticized today precisely because it was encouraged to do so by elements of Congress. TVA's accountability to its friends and to its critics in Congress explain some of its worst excesses including recent unjustified and unwarranted water projects. TVA worked hard within the forms of accountability that it had to prove to its friends that it would continue yesterday's practice and to its critics that it was not working for a radical new tomorrow. The real tragedy of the recent TVA is that it clung to yesterday's promise of cheap and abundant electrical power until it became an anachronism which needed radical adjustment to today's realities.

TVA has worked hard since 1977 to establish better forms of accountability and new policies which are more sound in environmental and social terms. TVA represents one of the most profound reforms of a government agency in recent time. It has established new policies of conservation that enable all consumers to save money by using less electrical power. It has instituted sounder policies in all phases of the coal cycle most notably it has cleaned up its emissions. It has reformed its rate structure to give consumers incentives to conserve and it has still preserved its original mandate to give residential customers a preference in rates.

One can fault TVA for any single issue or policy but to be fair one needs also to examine the package of changes within TVA and to assess the relation of any particular

policy to others. Thus, the rates for industrial users may be higher than rates of other nearby utilities but the rates of residential users are lower and industrial users have choices to achieve lower rates. Rates have increased. But in criticizing TVA for this it is important to distinguish between those recent rate increases which were due to the unwise nuclear construction program and those rate increases which were due to ending the unwise environmental subsidies of the past, such as sulfur emissions.

In the midst of all these changes TVA has created new forms of accountability. TVA instituted open meetings. It conducted its board meetings around the valley. It instituted a toll free phone line for residents of the valley. It conducted seminars and programs for civic groups in the valley and most importantly it brought groups which it had previously excluded into its discussions on policy. These groups include the League of Women Voters, Common Cause, Church Women United, Tennessee Valley Energy Coalition, the Sierra Club and many, many more. The point is that in the past eight years TVA has responded to past criticisms, it has instituted reform of past practices and it has increased its forms and practices of accountability.

More needs to be done. There is no question about that. But we should not overlook a good beginning. I think it is better to look at changes that would involve larger numbers of people and more diverse interests in TVA's policies rather than changes in a handful of officials at the top. I believe the new realities of energy production and use are not adequately reflected in the TVA at the grassroots. TVA needs change at the bottom, the grassroots, the municipal distributors and rural cooperatives. Every group reflects the interests of its members and I believe part of TVA's problems have been that the membership at its grass roots reflects commercial and industrial interests almost exclusively. These people need representation but so do residential customers, environmentalists and alternative energy advocates. The generation and use of electricity now entails changed economics in which more plants for industry no longer mean cheaper rates for residential customers. Rates have gone so high that someone must represent the interests of the poor and those with fixed incomes on the local utility boards and in the formation of their policies. The generation of electrical power also entails environmental concerns we cannot afford to ignore and a search for alternative sources and forms of energy.

But to focus exclusively on changes in the power program would be to reinforce the most serious division of

TVA's practice from its principles. TVA is not only a power program. It is an experiment in regional development. Human resource development has not been a major agenda item of TVA and it should be. TVA is in a region with significant amounts of rural poverty and all the accompanying statistics of deprivation that mock American attitudes of quality of life. Low income, unemployment, hunger, low levels of educational attainment, high rates of infant mortality, illiteracy, lack of access to health care and substandard housing are at intolerably high levels and impact too many people. These are national problems in two ways. First, the Tennessee Valley is part of the United States and second its problems of rural poverty occur in other parts of the country. TVA needs to begin anew its mission as a proving ground for policy and action to meet the needs of the rural poor. Its tentative beginnings in 1980 were set aside by emphasis on the power program. TVA should foster the cooperation of federal agencies to design effective policies of self-help for local improvement and should invent others on its own. It has done some work in this regard but far too little in proportion to the need. But here again TVA can only do what Congress permits and will reflect national attitudes towards government action to deal with social problems.

TVA remains an experiment that indicates American priorities. According to those of us who see in TVA's original principles an attractive image of ourselves and our aspirations as a nation, those principles should be renewed and embodied in new practice. TVA's recent efforts to reform its practices are a good start and offer us encouraging evidence that democratic experiments can change and adjust. But we need to challenge TVA to adopt new forms of democratic participation and new missions that extend the vision of the agency. This challenge is necessary so that we can be clear what we expect not only of TVA but of ourselves as people who direct our democratic experiments.

In light of these comments I suggest the following action. TVA should act to assure that members of diverse interest groups, residential customers, environmentalists and conservationists are appointed to the boards of the municipal distributors. TVA should encourage rural cooperatives to locate and encourage members of these groups to run for membership on local boards and require that all rural cooperatives enact policies to expand participation in the elections of board members.

Second, Congress should continue appropriations for TVA's non-power programs on the condition that TVA provide leadership in dealing with problems of the rural poor. Congress needs to demand of TVA that it create new forms of partnership with local leadership to initiate projects which can be disseminated at home and abroad. These national demonstration projects need to go beyond the easy and dubious answer of water projects and electrical power and deal with the difficult but compelling questions of the development of human resources.

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September 18, 1985

Gordon J. Humphrey, Chairman
Subcommittee on Regional
and Community Development
Committee on Environment
and Public Works
United States Senate
Washington, D.C. 20510

Dear Senator Humphrey,

I am pleased to respond to your letter of August 7 and the accompanying questions. I am enclosing the questions that you submitted to me and will number my answers to each of the questions correspondingly.

1. I have examined very carefully the literature of the 1930s and 1940s to identify the democratic elements of TVA. Much of this writing came from within the agency to be sure and needs to be taken with some skepticism. Nevertheless, others wrote frequently and at great length about TVA as a democratic experiment and provided another basis to determine what was uniquely democratic about TVA and what elements of TVA's self-analysis could be corroborated by external authorities.

I believe that observers saw TVA as a unique democratic experiment because it integrated five principles or beliefs. First, government is capable of positive action on behalf of people and should undertake some tasks which exceed the ability of people to do for themselves. Second, government action on behalf of people should begin with the worst situation first. Third, government action on behalf of people should be sensitive to the needs and values of the people involved and should involve the people affected by government action in the planning and implementation of that action. Fourth, it is appropriate to redistribute wealth, services, and political influence from those who enjoy too much of them to those who have less than they need. Woven into these principles was an underlying belief that the development of natural and human resources are related.

2a. It seems to me that there are two elements to decide whether someone has adequate voice in the decisions of an agency or not. The first element is representation of that person and the second is participation. One may maintain that only direct representation and participation make for adequate voice in decision making. But this has the consequence of requiring everyone to participate in every decision which may effect them. This is clearly impossible. Consequently, we must consider other forms of participation and other forms of representation. For the past eight years the Tennessee Valley Authority has created new forms for the direct participation of ratepayers and residents of the Tennessee Valley. It not only continued its open board meetings but it held board meetings throughout the Valley. It brought a wide variety of environmental and civic groups into discussion with TVA officials. These groups before were regarded as critics and held at arms length in any internal deliberations of the agency.

I believe that the voice of Valley residents has become louder and more adequate in the last eight years. I recognize that this is largely due to policies instituted by a new majority of board members. It is possible that new board members would institute new policies to reduce the voice of Valley residents in TVA. My answer, then, is a qualified yes. The people of the Tennessee Valley have an adequate voice in the decisions which are made for them because of the present policies of the board.

2b. Proper accountability is a matter of a person, group, or organization bearing consequences for their action.

2c. TVA's accountability to its friends and foes in congress works primarily through the formal procedures of hearings and appointments and the informal procedure of communication from individual representatives to members of the agency. That accountability has affected policy primarily by protesting rate increases which began in the late 1960s. The consequence of congressional criticism of rate increases firmed up TVA's resolution to avoid any increased production cost. This made TVA an intransigent foe of new costs to reduce sulphur emissions from its coal burning plants. This encouraged it also to continue its policy in coal purchasing which stimulated strip mining. In other words, TVA's system of accountability up to the mid-1970s worked primarily to encourage it to seek and to maintain the lowest possible cost in the production of electrical power even when this meant damage to human health and to the environment.

In addition, this same form of accountability stimulated TVA to expand its generating capacity and to maintain a nuclear construction program even after it became obvious that it was constructing surplus capacity.

2d. My own personal view was that the worst excesses of TVA occurred immediately after World War II and continued through the mid-60s. These excesses revolved around TVA's desire to maintain a monopoly on the production and distribution of electricity within the Valley and the transition from hydro electrical power to coal burning power. But it must be kept in mind that TVA's largest customer during this time was the Atomic Energy Commission. As late as 1959, TVA was still selling more than 50% of its electrical power to this federal agency. In addition, TVA was under heavy pressure in the 1950s to part with a portion of its market to permit private utilities into what had been its exclusive market. TVA's period of worst excess, in any estimate, occurred at the same time that it pursued a mission of national defense and opposed efforts to "cream" urban markets from its system.

TVA responded to these pressures by expanding its generating capacity through coal burning plants and by maintaining the lowest possible price for electricity. Given the decline of the coal market after World War II and given TVA's prominent new purchases of coal, TVA enjoyed a position of monopsony. The consequence of TVA's action at this time, intentional or not, was to drive down the price of coal in an already depressed market. Coal mining in the Tennessee Valley underwent a very substantial transition which TVA's policies exacerbated. A much larger portion of coal mining became surface or strip mining and coal operators were not able to meet the cost of union contracts at the prices TVA would buy coal. Consequently, during the 1950s in the Tennessee Valley coal mining became increasingly strip mining with nonunion labor. This was only one, but nonetheless, an important element in the depression that hit the Appalachian coal fields in the 1950s and which stimulated a national response to conditions of poverty in the 1960s.

The irony is that this agency created in the 1930s would contribute in any way to replicating depression-like conditions in the region that it was to develop. Moreover, TVA played little, if any, role in a new round of federal policies designed to eliminate poverty in the 1960s. TVA's response at this time was to plan the development of the tributary rivers including the Tellico Dam, and some less than effective efforts to reduce strip mining. These decisions were made by the people in charge and on the TVA board from the period of 1948 to 1965.

TVA's excesses were mitigated in the 1960s for several reasons. One, the destructive coal policies had peaked and plateaued by that time. Second, citizens groups and others began organized protest of TVA's policies. Third, TVA responded to some of these protests and began curbing the worst excesses of its policies. Fourth, TVA moved from coal burning plants to nuclear plants in an effort not to redress its coal policies but to avert the consequences of them.

3. Nineteen seventy-seven was a water shed year for TVA in terms of accountability for several reasons. First, S. David Freeman joined the TVA Board of Directors in that year. He immediately began negotiations to settle the controversy over air emissions with groups that had had little or no voice within TVA. In the next year, one TVA board member retired and the other TVA board member resigned. Consequently, shortly after David Freeman's arrival on the board there was a complete turnover at the board level.

At the same time there were profound changes in Congress especially among the Valley delegation. Ranking members from the Tennessee Valley such as Robert Jones of Alabama and Joe Evins of Tennessee retired by 1978. The TVA board had new congressional representatives and senators to report to on the various committees to which TVA related and new members of the Valley congressional caucus.

This experience would lead us to expect reform and change at times of significant change either in the makeup of the TVA board or in the makeup of the committees of Congress to which they report.

The next appointment to the TVA board is a very significant appointment. That new member will either solidify TVA's commitment to reform the practices of the 1950s to the 1970s or that member will erode the commitment to reform and contribute to a gradual return to TVA's policies of low cost power, abundant supplies, and a lack of accountability to all but its major and dominate client groups.

TVA is in a very important transition during which time the reforms that it as initiated in the past seven or eight years will either be consolidated or eroded. The new board member will have a major influence on what course TVA takes.

4. The period of TVA's worst excesses was a period from 1948 to about 1959 and the passing of the Bond Revenue Act. This is not to say that there have not been excesses since then but TVA undermined the coal economy of the region and compromised if not abandoned its multipurpose regional development mission for a single purpose of the production of low cost electricity. The people responsible for these excesses were those people who governed TVA within the agency itself and within the United States Congress, and the Executive Branch. TVA tried to disprove the claims of its critics and consequently responded to negative images of it and lost its own positive image. Adequate mechanisms of accountability did not exist at the period of TVA's worst excesses. There were mechanisms of accountability such as protest and court action and they were used. These mechanisms are costly and time consuming. Other mechanisms of accountability such as hearings were ineffective because they were bypassed in a much more fundamental conflict over the future and not merely the function of TVA.

It is my personal view that the people of Tennessee Valley may hold the agency's board of directors accountable for TVA's worst excesses and may hold the critics of TVA in Congress and the Executive Branch, and TVA's friends there, accountable for those excesses as well.

5. In the recent hearings on rate making legislated by the PURPA Act, TVA provided ratepayers and their representatives adequate forms for direct representation and direct participation. This form is still available to individual ratepayers as well as groups of ratepayers at TVA board meetings. The TVA board showed itself responsive to the testimony of these groups in maintaining the preference for residential ratepayers despite the urging of large industrial customers and the organization of its distributor boards. Even though residential ratepayers, the poor and other dependent populations do not have ordinary direct representation and participation in the agency, the agency has shown itself sensitive to their needs and has created staff positions to represent them as best possible.

There has been less structural change at the distributor board level. Consequently, though I would certainly endorse increased representation and participation of the poor and those with fixed incomes within TVA decision making, it seems to me more critical at this time to increase the representation and participation of those groups on the distributor boards. The distributor boards have immense influence not only in the implementation of TVA policy but they are the dominant interest group within TVA's political environment. They have used their influence, thus far, to challenge and question reforms within TVA. The utility boards have acted by and large as an interest group on behalf of regional and industrial development. Because of the present economics of electrical power generation by which new plant capacity means higher rates these groups by their purpose exert upward pressure on TVA prices. They have worked, thus far, to allocate higher rates for new power to residential users in increased proportion to existing policy. This does not represent the interest of the residential ratepayer, the poor and those with fixed income. These groups need direct representation and participation on those groups which have the greatest influence on TVA and which are using that influence today to gain policies which means higher rates for ratepayers.

One cannot talk about TVA's excesses without some reference to the nuclear program of TVA. It is necessary to be temperate and not use the benefit of hindsight. Even with this caution the following seems obvious. Those with oversight responsibility for TVA's construction gave TVA the greenlight by permitting a \$30 billion debt ceiling and bond indebtedness. Second, TVA had support within the Valley from the distributors to expand its nuclear capacity even after rates soared because of it. Third, the nuclear construction program and the operation of the reactors have been poorly managed apparently.

TVA is not a yardstick of positive action in the nuclear field. It treated the fire at Browns Ferry as a public relations problem and misconstrued criticism of nuclear power and its nuclear program as criticism of the agency itself.

This nuclear experience offers some analogies to the 1950s. TVA perverted its democratic tradition in a way. It continued to do what others said should not be done because it felt it was doing a good thing for people who did not know better. It applied its good reputation earned in the 1930s and applied to a new situation. The irony of TVA's recent criticism is that it centers around the actions which brought TVA glory early on. The tragedy of TVA is that it pursued three goals in an autocratic manner because it believed it had a democratic mission. To its credit, TVA now evidences the ability to admit serious mistakes and to undertake remedial action.

Sincerely,



Richard A. Couto
Director

RAC/kh

QUESTIONS FROM SENATOR HUMPHREY TO DR. RICHARD COUTO

1) TOWARD THE END OF YOUR TESTIMONY YOU STATE THAT RECENT CHANGES AT THE TENNESSEE VALLEY AUTHORITY, "OFFER US ENCOURAGING EVIDENCE THAT DEMOCRATIC EXPERIMENTS CAN CHANGE AND ADJUST." IN OTHER CONTEXTS YOU HAVE REFERRED TO TVA AS A "DEMOCRATIC MEANS OF REGIONAL DEVELOPMENT." WHAT ARE THE "DEMOCRATIC" ELEMENTS OF THE TVA EXPERIMENT?

2)a. DO THE PEOPLE OF THE TENNESSEE VALLEY, IN YOUR VIEW, HAVE AN ADEQUATE VOICE IN THE DECISIONS WHICH ARE MADE FOR THEM? IF SO, HOW DO YOU RECONCILE THIS WITH YOUR STATEMENT THAT, "TVA'S ACCOUNTABILITY TO ITS FRIENDS AND TO ITS CRITICS IN CONGRESS EXPLAIN SOME OF ITS WORST EXCESSES INCLUDING RECENT UNJUSTIFIED AND UNWARRANTED WATER PROJECTS."?

b. WHAT CONSTITUTES PROPER ACCOUNTABILITY?

c. HOW DOES TVA'S ACCOUNTABILITY TO FRIENDS AND FOES IN CONGRESS WORK, AND HOW HAS THAT AFFECTED POLICY?

d. WHAT, IN YOUR VIEW, WAS TVA'S "WORST EXCESSES" AND WHEN WERE THOSE DECISIONS MADE, AND BY WHOM?

3) YOU STATE IN YOUR TESTIMONY THAT 1977 WAS SOMEHOW A WATERSHED YEAR FOR TVA IN TERMS OF ACCOUNTABILITY.

a. WHAT FACTORS LED TO THESE "PROFOUND REFORMS?"

b. HOW CAN WE USE THIS EXPERIENCE AS A BASIS TO JUDGE WHAT WE CAN EXPECT FROM TVA IN TERMS OF REFORMS IN THE FUTURE?

c. WHAT SPECULATION CAN YOU OFFER AS TO THE FUTURE OF THE TENNESSEE VALLEY AUTHORITY. SPECIFICALLY, WHAT WILL HAPPEN IN TWO YEARS WHEN A NEW MEMBER IS NAMED TO THE BOARD OF DIRECTORS?

4) YOU STATE THAT OVER THE PAST EIGHT YEARS, TVA HAS INSTITUTED NEW MECHANISMS TO ENSURE ACCOUNTABILITY. MANY OF THESE WOULD APPEAR TO BE IMPORTANT, YET IT IS UNCLEAR TO ME AS TO WHAT ULTIMATE CONTRIBUTION THEY MAKE TOWARD ENSURING A VOICE FOR TVA'S VARIOUS CONSTITUENCIES. MOREOVER, SOME OF THE MECHANISMS EXISTED AT THE SAME TIME THAT TVA WAS ENGAGING IN WHAT YOU HAVE CALLED THE AGENCY'S "WORST EXCESSES."

a. IN VIEW OF THE EXISTENCE OF THESE MECHANISMS FOR ACCOUNTABILITY, WHO SHOULD THE PEOPLE OF THE TENNESSEE VALLEY HOLD ACCOUNTABLE FOR THE AGENCY'S EXCESSES?

5) YOU STATE, "RATES HAVE GONE SO HIGH THAT SOMEONE MUST REPRESENT THE INTERESTS OF THE POOR AND THOSE WITH FIXED INCOMES ON THE LOCAL UTILITY BOARDS AND IN THE FORMATION OF THEIR POLICIES..." I AGREE THAT THESE PEOPLE SHOULD HAVE A VOICE, BUT I AM WONDERING WHETHER THAT VOICE WOULD SOMEHOW BE MORE PROPERLY PLACED WHERE THE TRUE POWER OF THE TENNESSEE VALLEY AUTHORITY IS VESTED. WOULD YOU AGREE WITH THIS PROPOSITION?

STATEMENT OF DR. MOHAMED T. EL-ASHRY
BEFORE THE U.S. SENATE ENVIRONMENT &
PUBLIC WORKS COMMITTEE, SUBCOMMITTEE
ON REGIONAL AND COMMUNITY DEVELOPMENT;
OVERSIGHT HEARING ON TVA, WASHINGTON, D.C.
July 30, 1985

Mr. Chairman, and distinguished members of the subcommittee. I am pleased to appear before you to share my views on the Tennessee Valley Authority (TVA), particularly in the areas of natural resource management and the environment.

My name is Mohamed T. El-Ashry. I am Senior Associate with the World Resources Institute in Washington, D.C. However, I must emphasize that this testimony does not in any way represent the views of the Institute and that it is based solely on experience and knowledge gained at TVA during my four-year tenure as the agency's Director of Environmental Quality.

Mr. Chairman, I am not here today to praise a particular natural resource program at TVA or to plug one or more of the environmental policies that were implemented by the agency during my tenure. And I will not enumerate the many achievements, or shortcomings, of TVA in the first 50 years of its history; other witnesses have already done that or will be doing that. What I am going to address instead, Mr. Chairman, is whether TVA can be of future value to the rest of the nation, as it was during some periods of its past existence, particularly in providing innovative and cost-effective answers to the compelling energy and environmental problems that face this nation. In other words,

besides being a public utility, what should TVA's future mandate be so that continued investments of national taxpayers' funds can be justified?

TVA began life as a national demonstration agency for reforestation, flood control, navigation, fertilizer development, and electric power production. Congress and President Roosevelt intended the Tennessee Valley to be a national proving ground for new ideas and they also wanted a series of large, public works projects that would help lift a sagging regional economy. But they left no misunderstanding as to TVA's greater role. On every TVA facility are the words "Built for the People of the United States of America." TVA began with seed money from the people of this country because it was a national experiment to find answers to pressing national problems.

As TVA established and maintained a unified system for protecting, managing, and developing the Tennessee Valley's resources, it acquired a high level of expertise and capabilities, and a large number of functional facilities; a combination unprecedented anywhere in the public sector. TVA can, and should, utilize those facilities and expertise, that national funds helped establish in the first place, to help the nation come to grips with current and emerging energy and environmental problems. This does not mean that regional issues and concerns, and efforts to deal with them, would be eliminated. Rather, TVA would focus its unique capabilities on multifaceted problems and

issues pertinent to the region but which also have national significance. The Tennessee Valley region has the advantage of being similar to several other parts of the nation in terms of natural resources and environmental conditions.

The problems TVA faced in the 1930's were large: floods, deteriorating forests, soil erosion, wasted farmland, and a depressed economy. Most of these early problems have been solved, though sometimes by creating other problems. For example, as the agency devoted a considerable amount of its energy and resources for almost 25 years to the single purpose of producing electricity at the lowest cost possible, environmental sensitivity took a back seat. As increasing amounts of coal were mined and burned, heavy air, water, and land pollution resulted. In addition, TVA tried to be "everything to everyone."

In the late seventies, TVA returned to its original purpose by demonstrating how to conserve energy and protect the quality of air and water resources while producing electricity. I am submitting for the record a copy of an article from the March 1983, issue of Audobon magazine which illustrates some of these important achievements. As can be seen, TVA's recent role in reconciling the often conflicting concerns of environmental quality, energy production and economic development has had some recognition--although not, perhaps, as much as criticism for past mistakes. TVA now combines, under one roof, a responsibility for producing electricity while at the same time protecting

the environment in the region it serves. Such capabilities can be brought to bear on many of the energy and environmental problems facing the nation at this time.

While progress has been made toward meeting key environmental goals aimed at cleaning up the nation's air, water, and land, the job is far from being complete. According to a 1982 GAO report, unresolved problems and emerging issues such as acid rain, forest damage from air pollution, non-point source water pollution, toxic and radioactive waste disposal, groundwater contamination, and reduced federal funding will make attaining environmental standards more difficult. When one considers that the major portion of these issues are related to energy production and use, it would not be difficult to visualize TVA and the Tennessee Valley region as a national demonstration and proving ground at the energy-environment interface.

In addition, hundreds of billions of dollars have been spent by public and private entities to achieve national environmental quality goals; mostly in energy and related industries. When one realizes that it is also estimated that over \$100 billion dollars will be spent on pollution abatement in the 1980's, the urgency for the nation to seek alternative energy technologies and cost-effective environmental protection methods becomes obvious.

TVA has the capability and resources to develop needed future technology and solutions. However, in order for the

mission outlined above to be successfully carried out, a number of actions, both internal and external to TVA, must be taken.

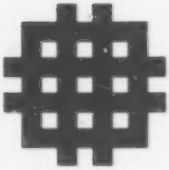
Key among these actions are the following:

- (1) Future emphasis on technology demonstration and cost-effective solutions is consistent with the original mandate as established by Congress in the TVA Act. However, in order to avoid misunderstandings and confusion as to direction and responsibilities within TVA, in the Valley, and among Congress, TVA should clearly articulate its future mission and an implementation plan, and Congress, with the support of Valley congressional delegation, should reaffirm such mandate and designate the agency as a "National Energy and Environmental Demonstration Agency."
- (2) TVA cannot support such a program solely by power-program financing or by current levels of appropriations. It is unreasonable to burden the TVA ratepayer with the total bill for a truly national program. While a part of the costs can justifiably be financed by power funds, the majority of the funds must come from increased congressional appropriations. Congress can also provide guidance on joint funding of specific projects among interested agencies such as TVA, DOE, and EPA.

- (3) Increased levels of appropriations should carry with them a higher level of accountability on the part of TVA. If this concept is implemented, TVA should be required to justify its expenditures of specially appropriated funds not only in terms of their regional significance, but in terms of their national value as well.
- (4) In the region, TVA should avoid duplication of state and other federal agencies' efforts. TVA should act as a catalyst for regional development and improvement by providing concepts, technical knowledge, and demonstrations to solve regional problems.
- (5) Strong agency leadership is a must for this concept to succeed. I believe such leadership currently exists at the top but is needed at different organizational levels to allow the many competent employees to make the necessary contributions to the agency's central goals. Since many of the approaches involved in the successful implementation of this concept are multidisciplinary in nature, TVA needs to build a stronger sense of teamwork.
- (6) In view of current national budgeting and deficit concerns, it might only be possible to institute this concept in an incremental manner. However, TVA must be willing to internally reshape some areas and reduce and eliminate some programs and activities as well.

- (7) There must be a long-term commitment by future TVA boards to the renewed mission. If Congress and TVA begin now to make the necessary preparations and adjustments for the proposed direction, the chances are good that TVA would have a strong national program in 5-10 years.

Mr. Chairman, in closing, let me say that TVA has not outgrown its usefulness. On the contrary, TVA can be a living laboratory for developing practical and cost-effective solutions to pressing national problems. The Tennessee Valley region has a diversity of energy resources and also faces the same tough environmental problems that must be overcome in many parts of this country. The concepts and solutions that can be shown to be successful in the Valley can be applied in various regions throughout the United States and in other countries as well. TVA has the necessary facilities and expertise, and the potential for making a significant national contribution in the years ahead--a contribution that could well surpass past accomplishments. But TVA will have to make some adjustments and it will need lots of support from both within as well as outside the Valley.



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October 10, 1985

Senator Gordon J. Humphrey
Chairman
Subcommittee on Regional
and Community Development
Washington, DC 20510

Dear Senator Humphrey:

Attached are my responses to the questions sent to me following my testimony before your Subcommittee. I apologize that my sickness prevented me from sending these answers earlier. Please let me know if I can be of further assistance.

Sincerely,

A handwritten signature in cursive script, reading "Mohamed T. El-Ashry".

Mohamed T. El-Ashry
Senior Associate

MTE:cv
Attachment

Responses to Questions for Mohamed El-Ashry from Senator Humphrey

Question 1.a. What were the major problems with TVA prior to this period and why did they develop?

Answer 1.a. By 1950, the use of electricity doubled every decade and demand outpaced the available hydro-power supply. TVA built a number of large coal-fired power plants and in the 1970s it began a very ambitious nuclear power program as well. During those years, the "power" program dominated the attention of the TVA Board as well as its top management, and the agency became just another utility. By 1977, TVA had become the nation's largest producer of sulfur dioxide (SO₂) and a major violator of national and state environmental laws. The preoccupation of TVA's Board and its management with producing all the kilowatts they can at the cheapest possible price is mainly to blame.

Question 1.b. Had the agency diverged from its original purpose? If so, how? Would you agree that TVA, as a natural resource agency, was actively encouraging policies which served to destroy the natural resources of the Valley? Was this undercutting the usefulness of the TVA mission?

Answer 1.b. Between 1950 and 1975, TVA, which was established to provide for the wise management and development of the region's natural resources, had become itself a contributor to the destruction of the Valley's environment. The leadership image that was earlier demonstrated through soil conservation, reforestation, and flood control activities had been replaced by that of the worst polluter in the country.

Question 1.c. You were at TVA during the period of transition. It is important for the subcommittee to understand what factors were involved in turning TVA around. Could you please elaborate on these?

Answer 1.c. In my view, many factors, internal and external, contributed to turning TVA around. The most important ones include: (1) A leadership and a commitment at the Board level to return TVA to its original mission -- that of an innovator in the areas of energy and natural resource manage-

ment. That also carried with it an explicit commitment to environmental quality and to operating TVA facilities in compliance with Federal and State laws. (2) Internal reorganization of the agency's divisions and departments that afforded equal importance, attention, and access to the different activities (power, natural resources, economic development, agriculture, etc.). (3) The appointment of qualified individuals, who were also committed to the new direction, in key management positions. (4) The "open door" policy that included Board meetings, listening sessions and constituency meetings which allowed the Valley residents to provide input and get their voices heard before final decisions are made. This openness also gave the TVA employees some sense of accountability to the public. Knowing that the public has an opportunity to address the TVA Board regarding actions the agency is (or is not) taking, increased the level of sensitivity towards the public among the agency's employees. (5) The strong interest and support of the U.S. Senate Environment and Public Works Committee as well as some key members of the Tennessee Valley Congressional delegation, in TVA's environmental activities.

Question 1.d. Finally, and most importantly, what does this experience suggest for the future of TVA? Is it conceivable that TVA could again embark upon a policy that is largely in an unwise direction, and which is inconsistent with its mission as a natural resource agency?

Answer 1.d. It is conceivable that TVA, under the right (or wrong) circumstances and leadership, could again embark upon the unwise policy directions of 1950-1975. This suggests that Congress, specially this Committee, should carefully scrutinize future nominees for filling vacant slots on the TVA Board not only in terms of their individual merit and commitment to the original TVA mission but also in terms of their cumulative impact on the existing mix of philosophies.

Question 2.a. What, in your view, constitutes accountability? Why is this concept important in the context of TVA?

Answer 2.a. As stated in the preamble to the question, I suggested a higher level of "accountability" in the context of increased appropriations for demonstrations in the areas of energy and environment. What I have in mind here is that the agency would propose a demonstration project (or projects) to be funded by direct appropriations from Congress or to cooperatively with another agency of the Federal government. Justification, in terms of national significance, would accompany the proposal, and performance standards would be set. Frequent audits would then ensure that commitments are met.

Question 2.b. Is it important for the people of the Tennessee Valley, who are asked to finance a large portion of TVA's operations, to have a voice in the decisions that the agency makes?

Answer 2.b. It is important for all the people, including those of the Tennessee Valley, who help finance TVA's operations to have a voice in the decisions being made. Currently, this is being done through the public comment process that is inherent in many Federal laws as well as through Congressional oversight. What other formal mechanisms ought to be added? I do not have a specific proposal to make.

Question 2.c. What specific suggestions can you offer the subcommittee in terms of introducing a higher level of accountability, and how would they work? Are you willing to endorse formal mechanisms for effective citizen participation in TVA's decision-making process? Are you suggesting that TVA be brought into the authorization process?

Answer 2.c See answers to Question 2.a&b above. In addition, and in response to a question regarding the Columbia Dam, I have already endorsed the proposal that public works projects such as Columbia ought to be brought into the authorization process.

Question 3 How can we ensure that TVA's leadership remains "strong" at the top? What speculation can you offer this subcommittee in terms of the future of TVA, assuming that the present structure is retained? Specifically, in the next two years

when a vacancy will occur on the Board of Directors? Is it conceivable that the course of TVA will again shift?

Answer 3

It is conceivable that the course of TVA would change again as a result of the vacancy that will occur on the Board in the next two years. This Committee, however, has developed strong interest in and knowledge about TVA. One mechanism for ensuring that "strong" leadership remains at the top lies in the level of scrutiny to which this Committee subjects potential nominees.

Responses to Questions from Senator Burdick

- Question 1 In your testimony, you state that TVA should avoid duplication of State and other Federal agency efforts. Could you elaborate on this--how do TVA's programs presently duplicate other agencies' programs?
- Answer 1 TVA, over its 52 years of existence, has provided many programs and services to the region. During that period of time many changes in jurisdiction and responsibilities among Federal and State agencies have also taken place. There is the tendency among government agencies to hold on to activities they have traditionally conducted, regardless of changing situations, and they become everything to everyone. What I have proposed in my testimony is a focused direction and emphasis for TVA in the areas of efficient energy production, alternative energy sources, natural resource management and environmental quality.
- Question 2 You state that some of the costs of a national demonstration program could reasonably be born by the TVA rate payers. Could you elaborate on this please?
- Answer 2 As indicated in Answer 1 above, some of the research and demonstration activities in the energy and environment fields will benefit the TVA power system and its operations as well as enhance the environment and natural resources of the region. Accordingly, it would make sense for the beneficiaries to share in the cost of these activities.
- Question 3 In your testimony, you seem to be saying that TVA is currently not a strong national demonstration program. Given the current authorization levels and administrative studies within the agency, could it ever be a strong national demonstration program? How, given these funding levels, could it become a strong national demonstration program?
- Answer 3 A strong research and demonstration program as I propose in my testimony will require increased

funding levels. However, current activities, at current funding levels, could also be sharply focussed towards programs of national significance.

Question 4 Dr. El-Ashry, do you believe TVA's work for foreign nations is being carried out in an environmentally sound manner?

Answer 4 I was not involved in TVA's work for foreign nations and as a result do not have as much knowledge or basis to answer this question.

Question 5 Could you comment on Dr. Blackwelder's assertion that TVA should not be used as a model for Third World Development?

Answer 5 I disagree with Dr. Blackwelder's assertion that TVA should not be used as a model for Third World Development. The TVA model, the concept of river basin resource development, is a good one if applied by correcting for the mistakes that happened over the years. Unfortunately, people look at the massive system of dams and power plants and their environmental problems as the TVA model, which is not totally correct. Integrated development of all resources of a river basin provide the answer to some Third World problems and is a better alternative to the haphazard, fragmented approach that has taken place in many parts of the world. Integrated river basin development, certainly, could provide future hope to the serious situation in Africa. And it does not have to be done in an environmentally destructive manner.

[The following article, from Audubon Magazine, was submitted for the record by Mr. El-Ashry.]

ALMOST FIFTY years ago, with the nation in economic turmoil and its future very uncertain, Congress created the Tennessee Valley Authority and gave it a mission that could be both the envy and the despair of any sensible bureaucracy: to preside over the salvation of a large region of the country, one whose most prominent social and physical characteristics were the poverty of its people and the woeful neglect of its land.

Any other agency would have been envious because of the sheer power

inherent in such an undertaking, but the equally enormous potential for failure would have generated despair, too. The newly formed agency wasted little time, however, in armchair speculation. There were dams to be built.

TVA went about its task with great energy, singular dedication, and not a little arrogance. It tamed the Tennessee River with a series of dams that controlled floods and produced electricity at rates so low that people used the stuff to heat their homes. As demand grew, TVA built coal-fired and then

nuclear-powered generators to supplement the hydro. Cheap power, no matter what the long-term cost, was the agency's operating maxim. TVA became a major producer of air, water, and land pollution.

When the era of ecological consciousness was born in the early 1960s, TVA did its best to brush the movement aside by arguing that it wasn't subject to the nation's environmental laws. Its executives juggled around cost-benefit ratios to make the most useless reservoir projects appear worthwhile.

America's single worst producer of air, water, and land pollution claims it is rectifying the errors of the past and pursuing a future in which industrial growth and environmental quality are compatible.

Can TVA Change Its Spots?

article by FRED POWLEDGE
photography by HANK MORGAN



TVA steam plants and director S. David Freeman in a solar modular home: "I'm saying, 'Look us over now.'"

The justly notorious Tellico Dam, not far from TVA's headquarters in Knoxville in eastern Tennessee, was a shameful example, as is the scandalous Columbia Dam now under construction on the Duck River, to the west. By late in the seventies the Tennessee Valley Authority, which Franklin D. Roosevelt described at its birth as "clothed with the power of government but possessed of the flexibility and initiative of a private enterprise," had used that power, flexibility, and initiative to become a dangerous enemy of the environment.

Now, says TVA, there has been a change—a "turnaround," to use a term much in favor around the agency. TVA says it is rectifying the mistakes of the past (many of which it freely acknowledges are its own) and is seriously pursuing a future in which the natural world and humans can coexist on more equitable terms. TVA says it's cleaning up the air and the water, reclaiming strip-mines, promoting meaningful land-use planning, sponsoring environmental education and aquaculture, studying and fostering various forms

of nondestructive recreation, and even spreading the word about the economic values of birdwatching. The agency is still producing electricity—capacity in 1982 was around 32 million kilowatts—but it is urging its customers to use less of it and rewarding them when they do, while at the same time making it relatively easy for homeowners to insulate their buildings, install energy-saving devices, and take advantage of the power of the sun. And the nuclear energy program has been severely cut back.

Government agencies are skilled, of course, at announcing breakthroughs and turnarounds, and often the proclamations precede the facts by several millennia. In the case of TVA, however, many of those whose positions and experience have made them critical and skeptical of the agency in the past are agreeing that there has been a significant change. Others who fight for environmental causes scoff at the notion as yet another of TVA's efforts to deceive the public. Turnaround or no, nothing that TVA does is likely to change the fact that, in its home valley,

practically nobody is neutral on the subject of the Tennessee Valley Authority. The agency goes too deeply into the environmental and economic fabric of the region for that.

THE CREATION of TVA was not strictly a response to the Depression, but the region involved was certainly depressed, and had been for some time. The valley's unifying characteristic, a source of its lushness, and the cause of many of its troubles was the Tennessee River: eighth largest in the nation in terms of flow; more than 650 miles long, with a 40,910-square-mile watershed that takes in parts of Virginia, North Carolina, Tennessee, Georgia, Alabama, Mississippi, and Kentucky; and given to frequent flooding, a matter that would have caused little concern but for the fact that there was considerable human development, including the city of Chattanooga, on its floodplain.

Another problem was the region's seriously depleted forests, and another



Richard M. Freeman outside TVA headquarters: the two Carter appointees have had "profound effects on TVA's direction."



TVA Chairman Charles H. Dean Jr.: a Reagan appointee and one of "the power people."

was the soil erosion caused by farmers who angled their plows directly into the sides of hills with no thought for tomorrow. So the caption on the federal act creating TVA on May 18, 1933, stated that its purpose was "to improve the navigability and to provide for the flood control of the Tennessee River; to provide for reforestation and the proper use of marginal lands in the Tennessee Valley; to provide for the agricultural and industrial development of said valley," and for other purposes. To oversee the agency's operation, Congress created a three-member board of directors, appointed by the President and confirmed by the Senate. The directors, who are expected to work full-time, serve staggered terms of nine years.

Somewhere along the line, those who directed TVA tried to narrow its mission. While the agency has always maintained staffs and facilities for studying and demonstrating ways to conserve and restore the region's natural resources, far more emphasis was placed on the power generation/heavy construction/dam building/river harness-

ing aspects of things. The authority and collaborating agencies whipped the Tennessee River into shape with nine major dams, then waded into the tributaries with forty-two more. A 650-mile-long navigable waterway was carved into the river, up from its junction with the Ohio at Paducah, Kentucky.

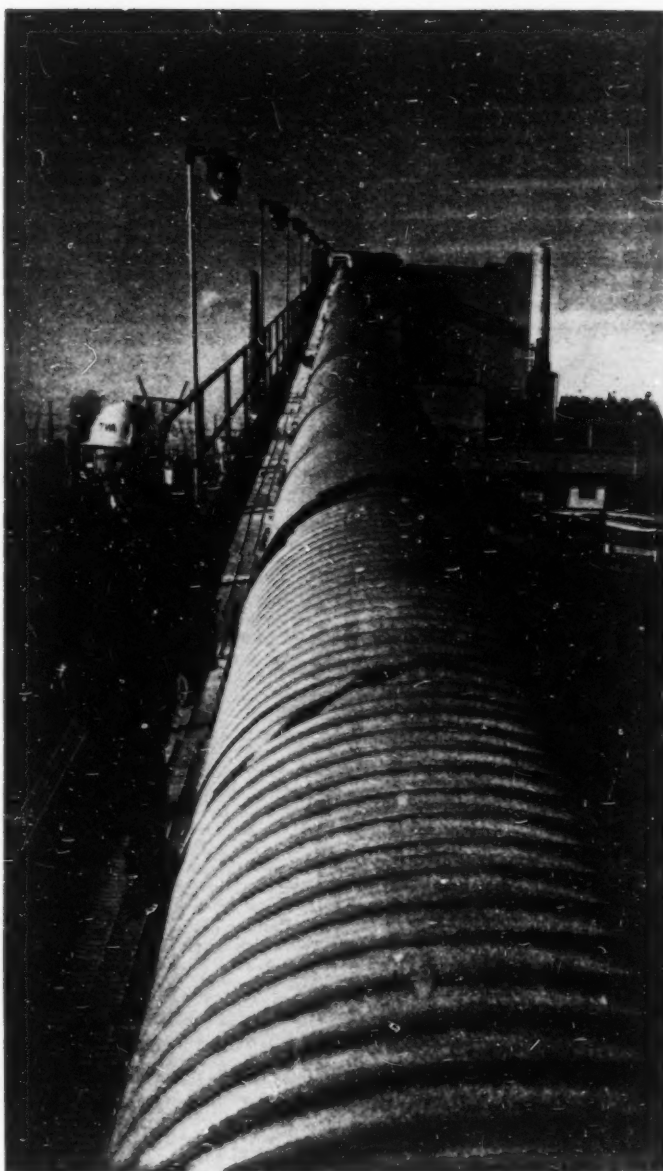
With the dams came forty-nine hydroelectric powerplants, and with those came TVA's remarkable success as a generator of electricity. The valley needed electricity badly back in 1933, when less than a quarter-million households had power; but with the coupling of really low prices to TVA's constant promotion of increased usage by homeowners and industry, the region started wallowing in the stuff. Entire towns erected billboards proclaiming themselves to be "totally electric."

Hydropower had to be supplemented. Fourteen large powerplants were built that ran on steam produced by nuclear fission or by burning coal. In the case of the latter, TVA became a major purchaser of locally mined coal—more than 35 million tons of it a year. That

meant coal that was typically high in sulfur content and that was strip-mined. So TVA's smokestacks made it the nation's prime polluter of the air with sulfur dioxide, while its appetite for coal made it a leading polluter of the earth. Its seemingly "clean" dams, meantime, were lowering water quality in a variety of ways.

The lust to build dams and more dams had other effects on the natural world and on people's lives. Land of archeological importance was bulldozed and flooded; families who had worked the land for generations had their property confiscated; cold, free-flowing trout streams were turned into sluggish, warm catfish nurseries; wildlife was disturbed and displaced and decimated; and, perhaps most important in what may turn out to be the long run, many square miles of prime, river-bottom farmland were taken out of production so that the dam builders, barge operators, local power structures, and politicians could build yet another reservoir and share in yet some more treasures from the pork-barrel system. In all of this, the Tennessee Valley Authority was the major and indispensable partner.

This state of affairs undoubtedly would have continued if a couple of events hadn't occurred in the late 1970s. One was the overnight transformation of energy from something that could generally be ignored to something that ruined budgets, cost people their jobs, and revealed itself as a resource that no longer could be wasted. The other was that unexpected vacancies gave President Jimmy Carter the opportunity to appoint all three members of the TVA board. One, gone now, was strictly a debt payment to Tennessee politicians, but the other two (enough to constitute a quorum) have had profound effects on TVA's direction. Richard M. Freeman is an articulate, thoughtful, former Chicago businessman. The appointee who has been most in the public's eye, however, is S. David Freeman (no relation), a civil engineer and lawyer who had worked for TVA in both capacities in the 1940s and 1950s, then served Carter as an energy and technology advisor. David Freeman, a Chattanooga who combines a very dry wit with a definite east Tennessee drawl, served as chairman of the board from May 1978 until June 1981, when he was succeeded in that



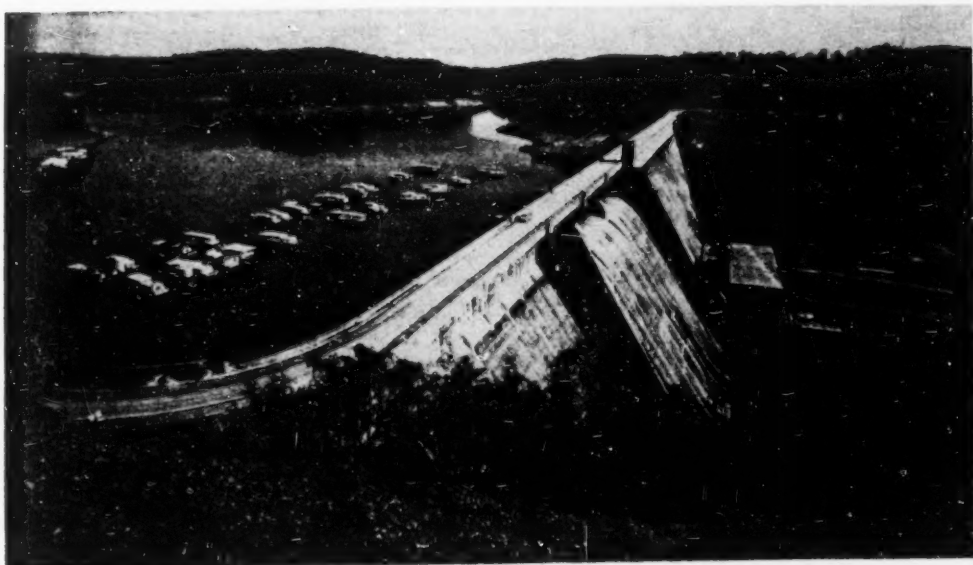
Mohamed T. El-Ashry (below right), a David Freeman recruit, is TVA's director of environmental quality. Cited as evidence of TVA's desire to solve environmental problems is a pilot powerplant near Paducah, Kentucky (left) and Norris Dam, where baffles raise the water's oxygen level, making life easier for fish.

position by Charles H. Dean Jr., a power utility manager who was appointed by President Ronald Reagan. Freeman's term as director runs until May 1984.

The two Freemans brought to the board an approach to TVA's problems that was shocking to many of the old-line electric-power barons who had had their way in the agency for so many years. David Freeman, who made many speeches as chairman (and who continues to make them) to audiences both in and out of the valley, followed a pattern not usually associated with government policy-makers: He would acknowledge, often in some detail, TVA's errors of the past (sometimes conveniently reminding his listeners that the sins had been committed before he came to the board); promise that TVA had changed its ways and now was acting as a true friend of the environment; and then cover all the remaining bases by reminding any partisans from the old days that this was not a dramatic reversal of the authority's role at all but rather a "return to TVA's roots," the roots that had been ignored during the cheap-electricity orgy.

Thus it became not surprising for the leader of a powerful government-utility hybrid to get up before audiences and say repeatedly, as David Freeman was saying as early as 1978, of his agency's stewardship of the land: "TVA has taken over ten percent of the valley's best farmland for its own steam electric plants and reservoir projects." And, "TVA got religion a little late on strip-mining. There is a legacy, a horrible legacy, of strip-mined land that is an embarrassment to me."

Or on the subject of water and air: "Just as we tended to ignore the tons of sulfur dioxide our powerplants were putting into the air, we paid insufficient attention to the effect our reservoirs were having on water quality . . . TVA generated cheap power at the expense of dirty air, unreclaimed land, and oxy-



gen-starved water."

Or faithfulness to the nation's environmental laws: "TVA has taken an adversarial stance toward the law."

But that has changed now, Freeman tells his audiences. "TVA," he says, "was originally intended as a 'yardstick' c. innovative government for the rest of the country. It has succeeded magnificently in providing a continuous 650-mile channel for navigation on the Tennessee River, in producing large amounts of power, and in saving mil-

lions of dollars in damages from seasonal floods. Now TVA has a chance to be a 'yardstick' for the 1980s by demonstrating the compatibility of industrial growth with environmental quality." And, lest some think TVA wants to be a do-good organization, he points out that clean water and air and undevastated land are not only good for business, but have become practically essential for it.

FROM THE STANDPOINT of someone who feels sensitive toward the environment, the words sound great. (They come not from just David Freeman. Both the other directors have spoken of the authority's need to stick to its original mission.) But what about actions? The turnaround has had four years to get turned around; if it consists of more than just talk, that should be apparent by now.

The answer, from an examination of what TVA is doing and of what many observers outside the agency have seen, is that the Tennessee Valley Authority really is trying to remedy its own environmental sins of the past. Equally important, it is trying (certainly more than any other agency of government) to demonstrate techniques and produce programs that can solve some of the knottier environmental problems of the

world and nation.

One indication of that, and evidence offered frequently by environmentalists, is David Freeman's recruitment in the fall of 1979 of Mohamed T. El-Ashry as TVA's director of environmental quality. El-Ashry, a tall, handsome geology PhD, came to the agency from the Environmental Defense Fund, an organization that has differed with TVA frequently in philosophy and in court. In his position at TVA, El-Ashry not only reports to his immediate office manager; he also advises TVA's board directly on matters of environmental importance.

Back in 1980, with less than a year on the job, El-Ashry said he had seen the new job as "a natural progression from EDF: Here were the things that we had been advocating that government ought to do, and now we were going to be part of it." Two years later, he said he felt the natural progression was working. "I have the power," he said, "and I have the support."

What makes that possible, according to El-Ashry, is the commitment of the TVA board, which not only has sought out environmentally sensitive experts and put them into responsible positions at the agency, but which also has offered encouragement to long-time TVA employees who might have been reluctant to make their sensitivity known





TVA's new mission: Charles Collins and Ross Schwemf raise catfish in warm water from a steam plant in Gallatin, Tennessee. And at Widow's Creek, Alabama, scrubbers make smoke "pale white and almost invisible."

before. These people, he said, are among the most valuable in carrying out TVA's newly defined mission.

What seems to excite El-Ashry the most about his work is the fact that it is an attempt to build relationships between mankind's need to preserve and protect the environment and its quite real need to use that same environment. TVA not only must use the water that flows through its valley; it also must find out how to take care of that water. TVA must not only continue in its role as the nation's largest power utility; it must solve the problems of pollution that come with power generation. One result of that is a great challenge. Another is nonstop controversy, particularly between the newer, environmentally minded employees and the old-timers who always thought of the agency as just an enormous powerplant.

"TVA has been controversial since Day One," said El-Ashry. "And it can't be anything else. It's a matter of how to utilize that controversial aspect of it to

be constructive. There's always conflict here. It's a balancing act.

"One of the nicest things about dealing with environmental issues here," he said, "is that we are not talking about preservation. We are not 'wilderness freaks.' That's just not the nature of the issues here. Here, we are talking about the nuts and bolts of environmental quality: Clean air. Clean water. And not just for the sake of cleanliness. It's the fact that it *was* dirty. It *was* bad. These are serious problems that are health hazards but that also are constraining the economic development of the region."

TVA'S NEWLY articulated mission is being furthered on a number of fronts, from experiments with growing catfish in leftover heated water from a steam plant to research into new forms of fertilizers. Among the programs of greatest interest to environmentalists are those involving the stewardship of the valley's (and, by not-too-strained extension, the planet's) water, its air, and its land, and those that encourage conservation and reuse of its renewable resources. Each is related to the others, of course.

In the area of water, one of the major problems concerns low levels of dissolved oxygen in releases from TVA dams. Behind the dams, water tends to sort itself into layers—warmer on top, colder below. In hot weather, there is little mixing of the layers; the bottom layer can't receive oxygen to replace that consumed by fish and decaying organic matter. TVA dams were built with the release openings in the bottom, so this colder, less oxygen-saturated water is what goes through the turbines and down the stream. If the level of dissolved oxygen is very low, fish kills can result. And with low oxygen levels it is more expensive to treat effluent discharged into the river downstream.

Some of TVA's experts were aware of the problem and looking for ways to cure it all along, but the matter of dissolved oxygen had a very low priority until fairly recently. Now it is receiving major attention from TVA as well as governments and researchers around the world.

A couple of years ago the authority thought it had a relatively simple an-

swer for the problem at hydropower dams: The installation of small baffles in the turbines, it was found, raised oxygen levels enough for TVA to start talking about a "breakthrough." Then problems developed. "We have a tendency," said director Richard Freeman in an interview not long ago, "to get too excited too early." Jack Davis, manager of the dissolved-oxygen program, said it was a matter of "calibrating the model to the real world." Now he is enthusiastic about an attack on the problem from a slightly different angle, one in which compressors are used to push air into the turbines and thence into the water.

Hydroelectric dams cause other problems. When the turbines are generating electricity, releases from the dams cause veritable walls of water to rush downstream, threatening the lives of boaters, fishermen, and other recreationists on the rivers, as well as upsetting ecological balances. Between power-generating releases, the downstream flow may be greatly reduced or even cut off altogether, frustrating rafters and canoeists (who speak of the operators' "turning off the river"), endangering aquatic life, and causing the concentration of municipal and industrial wastes. TVA's water-quality branch, which is headquartered in Chattanooga, is studying ways to avoid this problem, including placing a maze of rock jetties in the path of the river to slow down and thus smooth out the releases.

Although much of the Tennessee Valley is farmland and forest, toxic wastes in the water pose as much a threat there as in many urban centers, largely because polluting industries (including some, such as Olin, that are in the notorious class) had been encouraged by TVA to come to the valley and its rivers. Larry Clark, who directs the authority's regional water-management program, explained that TVA functions as a "whistle-blower" to let people know where the pollution is and, in most cases, who's responsible and what can be done about it. "Our role is primarily one of bringing these problems to the surface," he said. This has included the publication of two well-written reports identifying serious water problems and explaining how they arose. Neither document could be called optimistic, but both were unusual



Mining in the Cumberland Mountains: stripping on the left, reclamation on the right. Since 1981, TVA has required coal contractors to return sites to original contours.

in their willingness to name names.

Clark said that TVA's publication of details on Olin Corporation's bounteous contributions of mercury to the North Fork of the Holston River, along with what he described as David Freeman's unconcealed attitude of "let's sue them," seems to have modified the polluter's behavior. And TVA is considering some sort of intervention in an interstate pollution issue in which one of the states, North Carolina, seems paralyzed. The issue is the long-standing degradation of the Pigeon River, which flows into the French Broad River and thence to the Tennessee, by the Champion International paper and pulp mill in Canton. "The economic benefits [from the mill] to western North Carolina are substantial," says a TVA document; "therefore, no resolution of this water-quality problem in the near future is expected."

Although TVA lacks the police powers to compel compliance with the laws of the land and of nature, the fact that it is doing anything at all may be worthy of praise, especially in view of the retreat of other government agencies, notably the Environmental Protection Agency, on water-pollution issues. As James S. Morris, chief of the authority's water-quality branch, put it: "We are now actively engaged in things that we paid lip service to before. We seek the cooperation of everybody and anybody we can find."

TVA'S MOST damaging abuse of the planet has probably been in its treatment of the air. By 1977, its coal-fired generators were throwing more than two million tons of sulfur oxides a year into the skies of the Tennessee Valley and beyond; this represented 52 percent of the Southeast's total sulfur oxide emissions from utilities and 12 percent of the nation's. The authority resisted all attempts to reduce this aerial carnage (with the novel argument that, as a federal agency, it didn't have to obey federal law) until 1978, when David Freeman urged a settlement in a huge lawsuit brought by environmental and health groups. Now the agency's smokestacks and boilers are well on the way to compliance with the Clean Air Act, and TVA is experimenting with more efficient and inexpensive ways to reduce emissions even further.

Most efforts at compliance employ limestone-based "scrubbers," such as the one I toured at the Widow's Creek Steam Plant on the Tennessee River in northern Alabama. The mammoth, multilevel array of gauges, tubes, ducts, flues, boilers, and stacks was, to the unexpert eye, complicated enough even before the stage where the scrubbers took over the task of cleaning the flue gases; then it became really complex. That helped illustrate two big reasons why the power-generating industry has fought so long and hard against cleaning up its smokestacks: The process is

subject to malfunction because of its complexities, and it costs money to operate (running one of the scrubbers at Widow's Creek siphons about five percent of the power from the generator it cleans). But the smoke issuing from the plant's tall stacks is pale white, and almost invisible.

TVA has begun operations, meantime, in a pilot plant near Paducah, Kentucky, that deals with the harmful products of coal combustion before they get into the flue gases. Limestone is used here, too (it bonds to and neutralizes the unwanted sulfur released by the burning coal), but rather than reacting with the dirty gases it is mixed with the coal before burning. There are several promising aspects to this process, which is called atmospheric fluidized-bed combustion; one is that the residue is dry and inert rather than a sludge, and the other is that it removes some of the nitrogen oxides as well.

In addition to the technical commitments, TVA is demonstrating another approach to the sulfur-dioxide problem that must be regarded as innovative: It is acknowledging that the problem exists, which is something that hardly anyone else in the business of burning coal has done. A flap of some note arose not long ago when TVA put together a policy statement on acid rain that said, among other things, that "TVA recognizes the likelihood of a relationship between acid precipitation and the total load of sulfur dioxide and nitrogen oxide in the atmosphere. TVA also recognizes that long-range transport and transformation of pollutants in the plumes of fossil-fueled boilers of all types produce sulfate and nitrate particles which are believed to be linked to acid precipitation." The acknowledgment outraged some TVA staffers (presumably ones from the cheap-power-at-any-cost school), several of whom took their case to the press. Their position, which is frequently articulated in letters-to-the-editor columns by spokesmen for the well-oiled electric-power lobby, is that a definite linkage hasn't yet been proven.

To which David Freeman replied, in an interview, that the policy statement had been equivalent to acknowledging "that the Earth is round." He added: "The scientific evidence does overwhelmingly show the great likelihood that there is a linkage. This is not con-

fessing to any great sin, it's just facing up to a reality. But facing up to reality is just what was avoided by the management of this organization for quite a long time."

THE PROBLEMS of remedying damages to the air and water seem almost mechanically simple compared to TVA's obligations to the valley's land. There are few regions of the country that are more attractive and lush; and, outside of Florida, there are few regions that have been so shamelessly exploited or that attract the attentions of so many diverse potential users. Much of the exploitation, of course, was initiated and financed by the Tennessee Valley Authority itself.

Nowhere is this seen more clearly than in strip-mined areas. Because of the nature of the land and the way the coal is deposited, it is much easier to employ stripping, rather than deep-mining techniques, in the valley. Strippers have followed the contours of the thin seams around mountains and chains of mountains. In some cases they have simply lopped the mountaintops off, taken the coal, and moved on. In the process, they contributed mightily to the valley's erosion problems; they killed forests and wildlife; they created ugly gashes on the land; and they exposed toxic substances from the earth



An old road deadends in Lake Barkley, a TVA reservoir on the Cumberland River.

to rainwater in horrifying amounts (the government estimated in 1966 that 3.2 million tons of acid flowed each year into Appalachian streams from strip- and deep-mining). Although laws have been passed that seek to control these abuses, the damage is widespread.

Since 1981, TVA has been requiring its coal contractors to return their strip-mine sites to the original contours, and the agency has undertaken experimental programs in contour reclama-

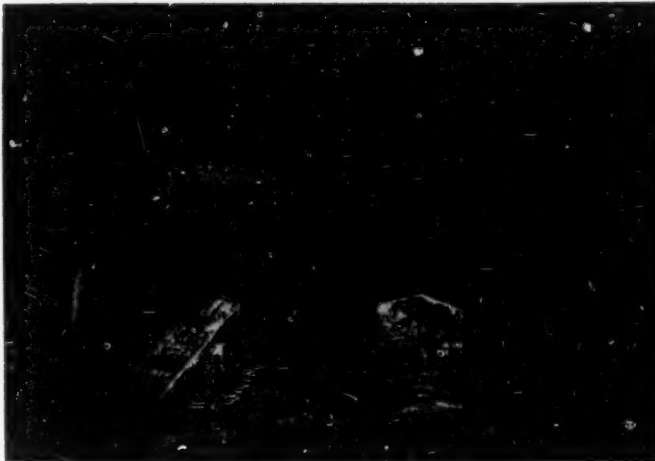
tion. Two TVA foresters, Al Curry and Thomas G. Zarger, took me on a Jeep trip around Massengale Mountain in northeastern Tennessee, where the effects of strip-mining, and then of efforts at reclamation, could be seen in chronological sequence.

At first, there were no signs of human attempts at reclamation—all that had been left to nature, and it was clear that nature would take a very long time to repair the damage. But as the Jeep bounced around the mountain alongside more recent efforts, the restored contours looked less and less artificial. At the end, I was left with the suspicion that there was some hope that this mountain would survive.

Al Curry said something that might, at first, make an armchair environmentalist's temple pound with rage, but which seemed, against this backdrop, to have more than a ring of truth to it: "That's the beautiful thing about strip-mining. You can do anything on a strip-mine, accomplish any objective you want to, because you're working on the surface. You can stop acid mine drainage, you can stop erosion, you can direct the water, you can even take care of the esthetics. Strip-mining lends itself to whatever you want to do, whatever expense you want to go to or are made to go to. We have the technology. But the problems associated with deep-mining—with acid mine drainage, mine fires, things like that—we don't have

Fishermen in warm water near the Gallatin plant: part of TVA's new constituency?





the technology to deal with that."

The authority tried its hand at another form of strip-mine reclamation in mountainous western North Carolina, where abandoned feldspar and mica mines were causing severe erosion and water-quality problems. TVA conducted an experimental revegetation project on a forty-acre plot and found it could be done relatively cheaply—for about \$1,200 an acre. Several landowners participated in this demonstration project.

TVA created valuable land when it condemned thousands of acres of farms and turned the Tennessee River into what David Freeman calls "a series of benign lakes." This pleased both sport and commercial fishermen, barge owners, and speculators, but it permanently angered many of the valley residents whose ancestral farms were confiscated, and who accuse TVA to this day of engaging in the more scurrilous forms of land grabbing.

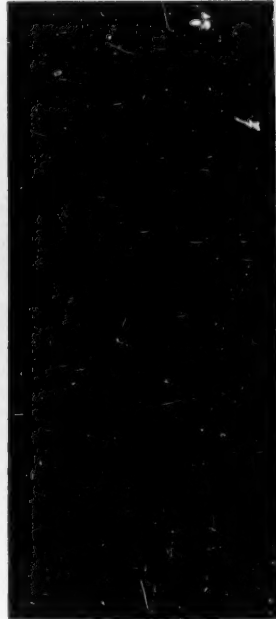
Alfred L. Davis is one of those residents. Davis, a farmer and the owner of a farm equipment company in the small town of Philadelphia, Tennessee, watched as his farm, which had been in his family for a century, was taken for the Tellico project—most of it not for the lake itself, but rather for buffer lands around it. When Davis was interviewed in 1980, as Tellico was being completed, he was clearly a bitter man,

not only because of the land grab but also because he was a farmer. He knew that thousands of acres of prime farmland would be ruined by the wasteful project.

"I'd like to see the lake drained," he said back then. "We may never see it in our lifetime, but it will be drained. By the year 2000, we'll be hard-put for land. Someday they'll have to drain the lake so we can grow food again."

REGARDLESS of the morality of TVA's actions, the agency acquired large quantities of lakeside land that once belonged to people like Alfred Davis—about 300,000 acres of it, along with more than 10,000 miles of shoreline. Much of that land has been bought or leased by developers. Two years ago, the authority began a program that seeks to put the remaining land to its best possible use.

There are, of course, an infinite number of ideas about what constitutes the best use; both duck hunters and chemical executives might see the same piece of land as just right for them. Bob Curtis, a wildlife biologist who runs TVA's land-management planning program, listed some of the interests involved in the land around Pickwick Reservoir, which inundates parts of Alabama, Mississippi, and Tennessee, and



which is the scene of TVA's first application of the planning program: "threatened and endangered species; sewage treatment; recreation, forestry; camping; hiking; commercial marinas and docks; utility rights of way; power-plants; industry of all sorts, from the huge papermill and chemical plant to the pulpwood cutter who wants a ramp where he can back his pickup up to a barge; agriculture; two federally protected habitat areas; highway access; municipal industrial parks; water-treatment plants; municipal buildings; and federal, state, county, and municipal parks."

The land-use plan that was devised for Pickwick is not the rigid "master plan" of the sort that is routinely turned out by city planning agencies and then ignored. It is intended to be a flexible document, with provision for updating and total review after eight or ten years. There are provisions for local participation. The planning is done by an interdisciplinary TVA group, representing several conflicting interests within the agency itself. And it makes



use of a newly compiled data base called the Geographic Information System, which uses modern computer graphics to store and display a great diversity of textual and mapped information.

Wildlife and recreation figure closely into TVA's land policies throughout the valley. The agency has always claimed great benefits from these resources when it was compiling (some would say fabricating) cost-benefit justifications for new dam projects. But part of the new sensitivity toward the environment seems to have given TVA the impetus to put some of its money and a lot of its expertise where its mouth is. Careful control of about 12,000 acres of lake-front wetland has provided a habitat for a half-million waterfowl where before "there had been virtually nothing," said Larry Calvert, the assistant director of TVA's division of land and forest resources. The agency has a raptor-restoration program, in which innovative hacking techniques have contributed to the successful nesting of eighty-three os-

preys, seven bald eagles, and six golden eagles.

There is no more exciting example of TVA's interest in the land than the place in western Kentucky and Tennessee known as Land Between the Lakes. LBL, as it is called, is a peninsula, six to eight miles wide and about forty miles long, that runs between Lake Barkley (a reservoir on the Cumberland River) and Kentucky Lake (one on the Tennessee River). Conceived in 1964 as

In Tennessee, a closed nuclear plant looms beyond an old graveyard. Whether due to economic realities or environmental sensitivity, TVA has cut back its nuclear program. Eggen Ferry Bridge, spanning Kentucky Lake, leads to Land Between the Lakes, a showplace resource management area. There, at "The Homeplace," people demonstrate the life-style of nineteenth-century settlers.





Heat stored in a saline layer at the bottom of TVA's one-acre experimental solar pond can be used to dry crops or warm buildings.

a "national demonstration in outdoor recreation, environmental education, and resource management," it is not a park or a wilderness area but rather a well-working example of the fact that undeveloped land can be used in a multiplicity of ways and still maintain its attractive, unspoiled character.

The uses range from all sorts of outdoor recreation to historic preservation, wildlife habitat, and commercial timbering. The anthem of multiple-use has been sung by government agencies for decades, but at LBL it seems to be working with an unusual lack of controversy and favoritism. "It's very much conservation rather than preservation," said Elizabeth Thach, LBL's manager. "It's wise use."

In the Tennessee Valley as a whole, the balance between competing interests is much less secure. TVA, it should be remembered, for years did everything possible to tip that balance in the direction of the exploiters.

"If there's an umbrella theme that

gives some kind of cohesiveness to what we're trying to do," said Larry Calvert of the land and forest resources office, "it would be this: that we see our job as figuring out how we can encourage the valley's trend toward a decentralized pattern of growth and at the same time protect the resource base that sustains it—and, equally important, protect this open-space quality that really gives the Tennessee Valley its flavor."

It will be a difficult job. David Freeman, commenting on his agency's recent record, said: "We've made progress on air and water. Those battles have to continue to be fought, and we haven't made enough progress. We've made a start. But we're losing out on the land. The enemy of the future is not dams. The dam-building era is essentially over; economics have made these massive water resource projects essentially uneconomic. The enemy is the continuation of urban sprawl and the lack of recognition that if you keep building McDonaldses and Wendys, pretty soon

there ain't going to be no hamburger for them to sell. I think the prospect of food shortages is a very real one."

Freeman was reminded of what Alfred Davis, the former landowner at Tellico, had said about the eventual prospect that the lake one day would have to be drained to recover the prime farmland. "It may be," said the TVA board member, without exactly agreeing with his critic, "that the prime farmland under Tellico Lake may be the farmland that survives the longest. It may be the only part of America that hasn't been paved over."

A CLEAR DEMONSTRATION of TVA's change of heart, according to some observers and traditional critics of the authority, may be found in its attitude toward energy conservation and the use of renewable energy sources such as the light and heat from the sun.

This can be confusing for TVA's cus-

tomers, who for decades have heard the agency urge them to use more and more electricity. But the objective of TVA's power-supply program hasn't changed at all, said Robert C. Steffy Jr., director of the division of energy conservation and rates. "The primary objective remains providing an adequate supply of electricity at the lowest feasible rates," he said. In the past that meant encouraging greater use, selling more kilowatt-hours, and lowering the unit cost. But now, "the best way to do it is through conservation and renewable resources."

"People hear us talking conservation," he said, "and they really think TVA is changing horses, when in fact that's not true. It's just that power-system economics have turned over. Capital costs are going up so rapidly now, and interest rates are so high, and the cost of adding new generating capacity is so high, that bringing a new plant on line causes an increase in rates instead of a decrease. By far the cheapest alternative is conservation and learning how to use electricity more efficiently."

To that end, TVA has undertaken a program to encourage residents of the valley to insulate their homes, conserve electricity in other ways (such as drawing it during off-peak hours), and take advantage of the much cheaper energy of the sun for both active and passive heating of their homes and water supplies. The program started five years ago with TVA's typically thorough study of the existing situation, which revealed very low levels of insulation in valley homes—not surprising in light of TVA's previous promotion of waste.

The conservation program contains components similar to those offered by power utilities elsewhere—home surveys (more than 700,000 have been performed thus far) conducted by technicians who can spot the need for insulation, storm windows, caulk, and the like, along with loans to customers who want to improve their situation or purchase solar devices. But in the Tennessee Valley there are some important differences. Since October 1982, TVA has provided (through its distributors, who serve as the retailers in getting the electricity to homeowners) even more attractive financing for those who want insulation, heat pumps, and solar and wood heaters.

The authority offers interest-free loans of up to \$1,200 for these improvements, and will lend up to \$3,600 more at TVA's cost of borrowing, which is running four to seven percentage points below prevailing bank rates. The interest-free loans may be repaid in periods of up to eighty-four months, and the larger ones over as much as ten years.

Another difference, especially important in the relatively new field of solar-power equipment, is that TVA practically guarantees the quality of the work and of the installer. Materials used must meet TVA's specifications, and before contractors are paid their work must pass TVA inspections.

A side effect of the conservation program has been tension within the TVA staff between those known as "the new environmental people" and those referred to as "the power people." "It is a tough thing to deal with internally," said Robert Steffy, but he added that TVA's momentum toward environmental sensitivity was so strong, and that the nation's environmental laws were so indelibly written on the books now, that it would be difficult for things to go back to the way they were. A different board of directors, he said, "could change the interpretation of things, but not the major thrust."

IN THE END, much of what is going on at the Tennessee Valley Authority comes down to the direction its three-member board of directors has given the organization—and not even three, for two of its members have been responsible for most of the recent initiatives that environmentalists might applaud.

This raises the question, inevitably, of the precariousness of TVA's "turn-around." If two people can turn TVA from what it was only a few years ago into what it is now and promises to be, cannot a reversal come just as quickly? Richard Freeman's term runs until 1987, but David Freeman's will expire in the spring of 1984. Ronald Reagan has already appointed one of "the power people," Charles H. Dean Jr., to the board.

The answer is "maybe." As Robert Steffy and others point out, much of the agency's current thrust is embedded in federal law and all of it is supported

by the TVA charter.

But the situation is precarious, nevertheless, and it is made more so by economic conditions, which have dictated recent rises in valley electric rates that some angry homeowners blame on environmentalism. (Actually, according to board chairman Dean, cleaning up the coal-fired plants has added about eight percent to the total power bill. An enormous part of the power system's expense budget—some thirty percent—goes for interest on money borrowed to build new generating plants. Even with increases, TVA's power charges are only thirty-five percent as high as those charged by New York City's much and justly maligned Consolidated Edison.)

At the same time criticism is rising, TVA is in danger of losing its traditional intimate relationship with its staunchest supporters of the past, the builders and congressmen who had their arms so deeply into the pork barrel. And so there is talk around TVA these days of a "new constituency" to support the agency past its fifty-year mark.

Some see a new constituency in the small businesses and entrepreneurs who will benefit from conservation and pollution cleanup. Others—Mohamed El-Ashry is among them—feel that southern hunters and fishermen, and other relatively gentle users of the land, are logical partners. Several point out that a roll of Kodachrome is about as expensive now as a box of bullets, and the nondestructive watcher of birds and wildflowers is already a constituent of great economic power. Others, remembering TVA's behavior in the past, fear the old constituency may not give up so easily. They acknowledge that the era of big dams may be over, but they worry about whether TVA will be able to resist smaller projects, such as the occasional "straightening" of a free-flowing stream that dares to meander.

Most everyone who has studied the situation from this viewpoint says that TVA's security would be increased greatly if environmental organizations and those who consider themselves environmentalists took a look around and realized that things had changed—that they and TVA are now on the same side. Some have already done so.

Tony Campbell, the executive director of the Tennessee Conservation League, testified before a congressional



Ruth Neff at the Tennessee capitol: she worries about TVA's "dual personality."

oversight hearing that "from my vantage point, TVA has returned to its roots." Rosemary Conrad, a Nashville lobbyist for a coalition of Tennessee environmental organizations, said: "The conclusions are that TVA is doing really a fantastic job," and that the two Freemans "have turned the agency around."

Ruth Neff is the executive director of the Nashville-based Tennessee Environmental Council. She uses the word "turnaround" to describe TVA's attitudes and actions on air pollution, and she has praise for the work of the agency's staff in natural resource programs. But TVA's chronic "dual personality" that results from the conflicting internal interests of power and natural resources, she said, still reveals itself from time to time. "The TVA water-quality staff who have been very concerned about the water-quality of reservoir discharges," she said, "are the same people who are willing to testify in a state hearing that the construction of Columbia Dam will have no adverse effect on water-quality standards."

Columbia Dam rankles more than one environmentalist, and it damages TVA's case for new sensitivity and root-returnings. A patent boondoggle that will serve almost exclusively to enrich local businessmen and politicians, the project was found in 1980 by the House Committee on Government Operations

to call for the destruction of 27,500 acres of productive farmland in order to provide "flood control" for 4,900 other acres downstream. And that is just one of the many cruel absurdities of the project. One big problem with Columbia is that although there has been no work on the dam since 1977, project-related studies are still going on at a time when TVA would have everyone subscribe to the turnaround theory.

Thus such critics as Frank M. Fly, a Murfreesboro lawyer who represents Mohamed El-Ashry's former employer, the Environmental Defense Fund, in a suit against the project, do not use the word "turnaround." "What they are doing," Fly said, "is capitulating to some of the economic realities in some of their construction projects and trying to claim environmental sensitivity as the reason for their actions."

COLUMBIA DAM IS clearly an example of the TVA leadership's decision not to take too many risks on a powerfully political matter. But as awful as the project is, it cannot obscure the progress that the agency has made in many other areas. Nor, in the mind of David Freeman and others at TVA, should it preclude environmentalists from acknowledging that TVA has become their friend. Freeman wants friends from the environmental community and is not reluctant to say so.

"One reason that I'm sitting here talking with you, rather than in my office pushing paper," he told me, "is that I feel that the National Audubon Society, the people who read Audubon magazine, the sixty or seventy percent of the people in this country who think of themselves as being environmentally sensitive, should be our clients."

"Unfortunately, and in large part because of what TVA has done in the last twenty years, we have been criticized by environmental organizations. And I'm not quarreling with that criticism. I'm saying, 'Look us over now. And of all the agencies in the federal government, especially those that have an association with building and with being in the electric-power business, if we are not the example of what should be done, if we're not providing a clean yardstick for the eighties and the nineties, I'd like to know about it. And if

we are, I think we merit the support of the people who think of themselves as environmentalists.'"

David Freeman is one of those who does not think the Tennessee Valley Authority's mostly new frame of mind has become indelibly imprinted on the agency or the region. It could all change, he said: "If there's no support for the programs that environmentally sensitive people in TVA have laid down, you are going to get people on the TVA board in the future who will turn the clock back. Because that's where the pressure is. I think TVA is ready, willing, and able to be a partner in this new effort. But we're not going to be a partner if our potential friends keep beating us over the head because of our past sins."

All of which sounds reasonable and proper in a society that professes to believe in the forgiveness of sins. But TVA has not yet achieved perfection, and some of its head-beating can be blamed only on itself and its adherence, even now, to the old ways.

When it became blatantly obvious that the Tellico project would never be the industrial mecca that its promoters had promised, TVA had to get rid of the land around its embarrassing lake. In November 1982, the agency auctioned off close to 11,000 acres of what had been prime farmland—the sort of farmland that David Freeman sees as so vital to the nation's future.

Although the land had been taken from farmers back in the beginning, TVA now refused to allow the farmers to buy it back. The rules were the land had to be sold in a block, said TVA, conveniently forgetting that it had changed many other rules before. A state redevelopment agency bought the land at the auction.

Alfred Davis was one of the farmers who attended the sale. "I'd have bought it back in a minute," he said later of the farmland he had lost. "They could have sold it back to the original landowners if they'd wanted to. But if they sold it to us, they'd be admitting that they were giving up, that they were unable to get industry in the way they'd planned."

Was he still bitter?

"Truly, yes," replied Alfred Davis. "I am, I think, a dedicated Christian, and it takes every bit of it to keep me from hating those people." ♦

TESTIMONY OF RICHARD E. AYRES
NATURAL RESOURCES DEFENSE COUNCIL
BEFORE THE SUBCOMMITTEE ON REGIONAL AND COMMUNITY DEVELOPMENT
SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
JULY 30, 1985

My name is Richard Ayres. I am senior staff attorney for the Natural Resources Defense Council here in Washington. I am also Chairman of the National Clean Air Coalition.

I came to know the Tennessee Valley Authority beginning in 1977, when, along with Professor Rivkin, I handled litigation for ten citizens' organizations who sued TVA to clean up air pollution to meet the health standards of the Clean Air Act.

Mr. Chairman, I think you have done a great service in calling these oversight hearings on TVA. TVA is a very large, and as these things go, very old federal agency. Every so often it is healthy to stop and consider how well it is performing, and to ask whether it is still performing a useful function for society.

Obviously, I am not familiar with all of TVA's operations. However, based on what I have seen, I think TVA continues to serve very important functions as a yardstick for the performance of other utilities, and as a unique laboratory to develop technologies and programs to deal with our environmental and energy problems.

TVA as Yardstick

As the people of New England know only too well, controlling the effects of pollution from coal-fired power plants is one of the most important issues facing the utility industry. Utilities

contribute about three quarters of all the sulfur oxides and a substantial portion of the nitrogen oxides pollution in the eastern United States.

New Englanders have seen the effects of this pollution, in the form of acid rain, on its lakes and streams, its monuments and buildings, and its forests, as have other areas across the country. In addition to these effects, people all over the eastern half of the country have suffered the reduced visibility and adverse health effects caused by sulfur oxides.

By now it is clear to almost everyone outside the utility industry that it is time to apply available techniques to clean up high sulfur coal-burning utility plants. Within the utility industry, however, only TVA accepts this fact.

And only TVA has proven that cutting emissions of sulfur oxides in half -- as recommended by numerous scientific bodies -- is practical and affordable. While other utilities have spent small fortunes on studies and propaganda to prove that acid rain doesn't exist, or is harmless, or is too expensive to do anything about, TVA's control program has shown the hollowness of these claims.

TVA has not always been a leader in pollution control. In the early 1970's TVA was a major exponent of the "up, up and away" tall stacks theory. In 1973 TVA even went to the Supreme Court to argue it was not subject to State permit laws. In 1977, when our clients sued, TVA was the largest sulfur oxides polluter in North America, emitting about 2.4 million tons that year.

But that began to change when we brought suit, and when David Freeman, and then Richard Freeman, were appointed to TVA's Board of Directors. Rather than tie up the issue in litigation indefinitely, they led TVA into sitting down to hammer out a negotiated settlement. Within one year we arrived at a workable clean-up program that balanced the interests of rate-payers and the public interest in healthful air quality.

As a result of this program TVA cut sulfur oxides emissions by over a million tons. Emissions in 1983 and 1984 were down from 2.4 million tons to one million tons. The capital cost of this program was about \$1.3 billion dollars, with annualized costs of about \$390 million. The maximum rate increase was held to under 10 percent, and the cost of sulfur removal to a highly cost-effective \$375/ton.

TVA is also the only high sulfur coal-burning utility to publicly support further emission reductions in order to meet a 10-12 million ton/year sulfur oxides reduction target to control acid rain.

In other words, TVA's air pollution control program has become a yardstick for the utility industry, which unfortunately has shown how poorly other utilities have performed.

TVA's air pollution control program has also propelled the agency into a position of leadership with respect to responsiveness to the public. The utility industry as a whole does not have an enviable record of responsiveness, and in the past TVA was widely criticized also.

In settling the air pollution control suit, however, TVA agreed to an unprecedented arrangement for involving citizens. An "Implementation Committee" was created to oversee the 5-year clean-up program, which was made up of TVA staff, representatives of state and federal governments, and all of the private organizations who were plaintiffs in the litigation. This committee met regularly and often. It became the forum in which many major and minor issues were worked out, speeding compliance and eliminating further litigation. I think this committee was an important influence which taught both TVA and the citizens' organizations that they could gain from each other. Since then TVA has created other such working committees to deal with environmental and other problems.

TVA as Laboratory

In addition to its yardstick function, TVA has a unique role as laboratory. As Senators on this Committee are especially aware, our ability to deal with public policy issues such as acid rain and energy often depends on new technologies and programs. Twenty years ago, there were no practical scrubbers to remove sulfur oxides pollution; today the development of better and cheaper control technologies could make acid rain control less controversial. Similarly, the policy dilemmas associated with the major forms of energy production can be lessened to the extent we can show the practicality of energy conservation programs.

TVA is uniquely able to serve as a laboratory to develop answers to these problems. Private utilities have not served this function. Whether it is because they do not want to develop pollution technologies they will then be required to use, or because they fear stockholders and public utility commissions will frown on such efforts, they are unwilling to take on research or demonstration projects. They have also been slow to exploit the potential for energy conservation. EPA and other government agencies, on the other hand, do not run power plants and do not have staffs composed of power plant engineers and operators.

Because TVA is a government agency, it has had the ability to pursue important innovations. At its Shawnee power plant, TVA has dedicated one full-sized power unit to research on scrubber technology for some time.

The agency has built a 20 megawatt pilot fluidized bed combustion ("FBC") unit at the Shawnee plant, and has plans to build a full size 160 megawatt demonstration FBC unit there. Fluidized bed combustion offers the possibility of integrating combustion and sulfur removal within the boiler that can achieve substantial emission reductions at relatively low cost.

TVA is also testing "spray drying" as an alternative to conventional scrubbing at a small pilot scale at its Shawnee test facility. This technique for reducing sulfur pollution, which uses less water and produces a dry, easier-to-handle waste, has been used on western coals but has not yet been applied successfully to high sulfur eastern coals.

This work is of great national importance, and it is not being done elsewhere.

While I cannot speak knowledgeably of other areas, I believe TVA's unique status as a public institution has made it a laboratory elsewhere also -- for example, for energy conservation measures.

Conclusion

To sum up, I am glad the Committee on Public Works has initiated oversight hearings on TVA. Like any other large institution, it needs to be held accountable to the public. TVA has often been criticized, and some critics have questioned the need for a government agency such as TVA today. Based on what I have seen, I would suggest that there are important functions for TVA to play, as a yardstick for private industry and a leader in research and development.

I would also suggest that to play these roles, the agency must have leaders who share this positive vision of TVA's purposes. Much of the criticism of TVA developed during a period when the Board lost sight of these missions. I think it is most important that this Committee assure that future leaders continue to share such a vision.

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TESTIMONY OF DEAN HILL RIVKIN
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BEFORE THE SUBCOMMITTEE ON REGIONAL AND
COMMUNITY DEVELOPMENT
UNITED STATES SENATE COMMITTEE
ON ENVIRONMENT AND PUBLIC WORKS

OVERSIGHT HEARING ON THE
TENNESSEE VALLEY AUTHORITY

JULY 30, 1985
WASHINGTON, D.C.

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TVA: "BACK TO THE FUTURE"

My name is Dean Hill Rivkin. I am Professor of Law at The University of Tennessee College of Law, where I specialize in environmental law, policy, and litigation. Since my student days in the late 1960's, I have been a close observer of the Tennessee Valley Authority. Over the years, I have participated in many conferences and meetings about TVA policies and practices and have devoted considerable scholarly attention to TVA. Most recently, I contributed a chapter, "TVA, the Courts, and the Public Interest," to a book entitled TVA: Fifty Years of Grass-roots Bureaucracy (University of Illinois Press 1983).

In addition to my theoretical interests in this agency, I have been heavily involved in the representation of Valley grass-roots organizations in litigation against TVA. In Save Our Cumberland Mountains v. TVA, 374 F. Supp. 846 (E.D. Tenn. 1972), I represented an organization of citizens who resided in the coalfields of east Tennessee in a challenge to TVA's failure to curb deliveries of coal in illegally overweight trucks to its coal-fired steam plants. These trucks caused widespread damage to primary roads throughout the coalfields. Although the litigation was unsuccessful, in 1979 a new TVA Board reversed the agency's policy and inserted in TVA coal contracts a provision declaring that TVA would no longer pay for coal that is delivered in trucks substantially above the state weight and axle limits.

In Tennessee Thoracic Society v. Freeman, No. 77-3286 et seq. (M.D. Tenn.) (consent decree entered Dec. 23, 1980), I represented a Valley-wide coalition of health, environmental, consumer, and good-government groups in litigation seeking to compel compliance by TVA with the federal Clean Air Act. As this Committee is well aware, this litigation was concluded when TVA entered into a consent decree with my clients, EPA, and the states of Alabama and Kentucky that required TVA to reduce its system-wide SO₂ emissions by over one million tons. The implementation of this massive program of pollution control was overseen by an Implementation Committee composed of citizens and government and TVA officials responsible for the clean-up task. I'll address this path-breaking mechanism of citizen accountability below.

Finally, in Tennessee Valley Energy Coalition v. TVA, No. 81-1069 (M.D. Tenn. filed Oct. 2, 1981), in a case still pending, I represent a grass-roots consumer organization in a challenge to TVA's policy, which the agency claims is compelled by the TVA Act and Bond Resolutions, of automatically charging current consumers -- rather than capitalizing -- the costs of interest during construction of nuclear power plants. TVA's cancellation and deferral of a number of proposed nuclear units, a decision that was made subsequent to the filing of this lawsuit, has substantially reduced the size of the interest payments that currently are borne by TVA consumers.

In my testimony today, I shall develop three propositions about TVA's evolving policies and practices affecting the environment and the accountability of the agency for its actions. These are:

1. During the 1960's and much of the 1970's, TVA radically departed from its original mission and became -- as the phrase goes -- "just another power company."
2. Today, TVA is forging an environmental mission faithful to its charter and important to the nation.
3. In the future, if its current policies and programs survive, and prosper, TVA can again recapture the country's imagination as a grand experiment in democratic innovation.

I. THE PAST

TVA was founded on the concept of integrated resource development. Its charter enunciated a mission that required the agency to balance a variety of seemingly diverse but in fact complementary goals and responsibilities. TVA's creators clearly intended that the agency serve as an incubator for innovation in areas such as environmental conservation, industrial development, and citizen participation.

TVA's early successes have been reasonably well documented and are beyond the scope of this testimony. The national character of the agency was highlighted during and after World War II, when TVA assumed the task of providing reliable power to industries heavily involved in the war effort and to the federal government's nuclear program based in Oak Ridge, Tennessee.

During these years, TVA embarked on its course of being the nation's largest utility.

TVA took these responsibilities seriously, perhaps too seriously. The generation of cheap power became the agency's overriding purpose -- to the ultimate exclusion of other important goals. By the late 1960's, power literally ran TVA.

The consequences of TVA's myopic focus on cheap power were most intensely felt by the agency during the 1970's. TVA emerged as a symbol of resistance to change. Behind closed doors, the agency instigated an adversarial relationship with its own consumers. The growing environmental and consumer movements were seen as enemies rather than opportunities.

With the appointment of a new Board in the late 1970's, TVA began to formulate a modern mission for the agency. The flexibility inherent in the TVA Act permitted the new Directors to reverse old policies and to initiate new ones. A serious effort began to recapture the original vision of an agency dedicated to creative and responsible resource management and to energy and environmental programs that would serve as a model for the nation. In the environmental area, a few of these initiatives deserve special mention.

A. Air Pollution

In response to litigation begun by its own consumers, TVA reduced its systemwide SO_2 emissions by over one million tons in approximately five years from 1978-1983. Equally as important,

TVA used forefront methods of pollution control, including flue gas scrubbing and coal washing. Most notably, TVA ratepayers, who bore the cost of this nearly billion dollar clean-up, did not experience dramatic increases in their electric bills.

One aspect of this pollution control program deserves show-casing. The Implementation Committee created by the consent decree delegated to representatives of the parties to the case -- citizens' organizations, EPA, Alabama, Kentucky, and TVA -- the responsibility of monitoring the progress of this complex compliance program. Citizen-experts worked hand-in-hand with TVA-experts to accomplish what must be regarded as a model pollution control program for utilities. The partnership that oversaw this effort represented a unique mechanism of accountability that harkens back to the early days of TVA's relationships with the Valley.

B. Water Resources

During this new Board era, TVA also halted its economically and environmentally indefensible dam building program and resolved not to construct new dams in the future. The unfortunate completion of the Tellico Dam and the continuation of formal support for the Columbia Dam represented vestiges of the old TVA. The new Board also enacted salutary policies stopping destructive stream channelization projects and imposing strict environmental controls on necessary stream and river work.

C. Strip-Mining

As one of the largest purchasers of coal in the country, TVA reexamined its strong influence on environmental practices in the coalfields and intensified its monitoring of contract mines. The agency began actively cooperating with the Federal Office of Surface Mining (OSM) in curbing environmental abuses in the TVA region. TVA also devoted its considerable expertise in land reclamation to projects designed to restore strip-mined ravaged land.

D. Nuclear Power

Irrespective of the current crisis afflicting TVA's nuclear program, the new TVA Board resolved, after careful study, that the health, safety, and pocketbooks of Valley residents would be better preserved by the storage of high-level nuclear waste at the reactor site, rather than at a centralized storage facility. TVA's data and expertise on this subject will undoubtedly play a large role in the current debate over the construction of a centralized nuclear waste storage facility (called Monitored Retrievable Storage) that DOE is proposing to locate in Tennessee.

E. Energy Conservation

Inextricably linked to TVA's environmental initiatives in the late 1970's was a far-reaching program of energy conservation. This comprehensive scheme involved programs ranging from home insulation to solar power to cogeneration. TVA's quest to develop more benign sources of energy for the Valley inspired other utilities to reexamine the conventional wisdom of constructing large, centralized power plants.

With the creation of these programs and policies (and others), the TVA Board of the late 1970's and early 1980's began the process of transforming TVA into a national leader on energy and environmental matters. This new Board recognized the national value of combining a pervasive environmental sensitivity with the country's largest utility system. The new Board also began to involve Valley citizens, as well as national experts, in the process of planning TVA's future.

II. THE PRESENT

I am cautiously happy to say that the current TVA Board has continued many of the policies inaugurated by its predecessor and has begun to branch out into other important areas. A sampling of current TVA activities reveals that the formative mission begun just a few years ago is crystallizing into a full-blown step, to take-off on a current movie title, "Back to the Future."

A. Air Pollution

Today, TVA stands as a leader in the national debate over acid rain. True to its role as a national laboratory, TVA experts are conducting research and devising policy recommendations on the acid rain issue. Unlike most of the utility industry, TVA has recognized that the acid rain problem is national in scope, demanding comprehensive solutions. By showing that the nation's largest utility can rapidly accomplish a sizeable SO₂ reduction without a major rate increase, TVA can credibly claim that the acid rain problem can and must be addressed by the utility industry and Congress.

On the equally important issue -- toxic air pollutants -- TVA's expertise in air pollution monitoring is the foundation for an important program being conducted in Chattanooga, Tennessee, by EPA and state and local authorities. Called Environmental Testing and Monitoring Survey (ETMS), this project calls for area-wide testing for toxic emissions in the Chattanooga airshed. Chattanooga was selected for this national demonstration largely because of TVA's experience and efforts in air pollution control.

B. Water Resources

The current TVA Board has commendably continued the policies governing dam construction and stream channelization started by its predecessor. It has gone one significant step further that deserves note. TVA has devoted considerable atten-

tion and expertise to one of the most pressing environmental issues on the nation's agenda: groundwater contamination. Through research, education, and coordination with a diverse group of state and local entities, TVA appears intent on making the Tennessee Valley a pioneer in solving the serious groundwater problems that affect drinking water and public health nationwide.

C. Strip-Mining

The current Board is continuing its support of TVA's role in repairing the extensive damage done to Valley land and watersheds by coal strip-mining. In this connection, it is important to emphasize that the coalfields in TVA's area of concern are the source of energy supplies for large segments of the country. The impacts of coal-mining are therefore a problem of national scale. It is only equitable that an agency like TVA be available to deal with such problems.

D. Toxic and Hazardous Waste

TVA continues to play an indispensable role in identifying and remedying serious problems caused by toxic and hazardous waste in the Valley. For example, TVA assisted the residents of Triana, Alabama in resolving a major toxic pollution problem that beset the Triana community. In Oak Ridge, Tennessee, TVA technical experts are working closely with local and state authorities in achieving the clean-up of the DOE reservation. It is not coincidental, given the size of the federal presence in the Valley,

that the toxic problems both in Triana and Oak Ridge emanated from federal facilities. The existence of a TVA to ameliorate these impacts is a benefit, therefore, not only to the region but also to the country. I think it is only fair to say that the resources on the local and state levels to deal with problems of this magnitude are simply inadequate. TVA's role as catalyst and resource is crucial in these instances to the complete protection of the public health and safety.

There are other TVA programs worth mentioning. The Land Between The Lakes, a multiple demonstration combining environmental education with stewardship of the land and recreation, is a one-of-a-kind facility in America. TVA's soil and water conservation programs meet a real need in the region and, by example, in the country. TVA's programs concentrating attention on the quality of releases from reservoirs is also producing results of national import.

E. Accountability

The success of these substantive programs, TVA seems to have recognized, depends on informed and active participation by citizens in the Valley. The Air Implementation Committee described above serves as a precedent for TVA's expanded concept of public participation. There is real hope that TVA will be at the forefront of developing meaningful mechanisms for citizen involvement in creating and executing TVA's environmental agenda. There are bright signs that the days of cosmetic public participation are

evolving into an approach that entails real empowerment for Valley residents.

For example, TVA's Environmental Quality Staff currently is collaborating with the Valley Environmental Network (VEN) in choosing areas in which TVA can contribute in the future to the environmental concerns of the Valley and the country. This formative endeavor, in which expertise and decision-making is shared rather than imposed, may set an example for citizen involvement in other TVA programs and policies. Although the specter of cooptation, as Philip Selzick described in his classic TVA and the Grassroots, always hangs over a participatory mechanism, the experience of the involved citizens as past adversaries of the TVA bureaucracy make them more effective players today.

III. THE FUTURE

TVA's future as a beacon of creative federalism depends on the ability of the agency's present leadership to capitalize on the valuable programs that have been treated in this testimony and to expand the lessons learned into a blossoming program of integrated resource management. The challenge that faces the agency today is to craft the various agency programs -- both power and nonpower -- into a coherent whole that uses the Valley's abundant natural and human resources.

More concretely, TVA's success or failure should be judged on its success in achieving its original mission on a scale suited to the twenty-first century. Such a program would

involve Valley citizens in creating their own future using TVA as a springboard for local and regional economic development initiatives. By necessity, TVA would have to become more involved in ensuring that environmental concerns play a larger role than they currently do in economic development planning and decisions. Land-use controls, often an unpopular concept, must be intelligently formulated, and TVA has a large role to play here.

The fulfillment of this original vision can be accomplished within the loose confines of the TVA Act. For example, TVA could readily expand its apparatus for public participation by complying with the letter and spirit of the Federal Advisory Committee Act and involving citizens in all phases of its operations, particularly the power program. An expansive -- rather than crabbed -- reading of the National Environmental Policy Act would also lead to earlier citizen involvement in major TVA decisions affecting the environment. It is enticing to wonder, for example, whether informed citizen involvement at the earliest stages of TVA's nuclear build-up would have served as a check on some of the key assumptions that TVA made to justify what turned out to be a wasteful exercise.

In conclusion, TVA appears to be on the right track. A substantial reduction of existing programs and capacities could easily derail TVA from this promising course. I would encourage this Committee to scrutinize TVA again in five years to make sure that the agency does not stray from its present path. You can be assured that concerned people in the Valley will be vigilantly watching.

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September 13, 1985

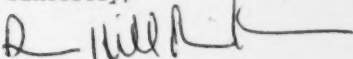
Senator Gordon J. Humphrey, Chair
Subcommittee on Regional and Community
Development
Committee on Environment and Public Works
United States Senate
Washington, DC 20510

Dear Senator Humphrey:

This is in response to your letter of August 7, 1985, requesting that I provide answers to question propounded by you and Senator Burdick concerning TVA. As I am sure you are aware, the subject matter of these questions encompasses a broad spectrum of issues and data concerning TVA. To answer these questions fully and completely would require a massive research project whose magnitude would be limited only by the imagination of the researcher. Therefore, my responses to these questions draw on my experiences with the agency, but do not purport to be conclusions based on research or investigation. I hope they serve your purposes.

If I can provide you or your staff with any further information, please let me know. I appreciate the opportunity to participate in this important oversight process.

Sincerely,



Dean Hill Rivkin
Professor of Law

W/TH/A

QUESTIONS FROM SENATOR HUMPHREY TO DEAN HILL RIVKIN

1)a. ON PAGE 10 OF YOUR TESTIMONY, YOU STATE THAT, "THERE ARE BRIGHT SIGNS THAT THE DAYS OF COSMETIC PUBLIC PARTICIPATION ARE EVOLVING INTO AN APPROACH THAT ENTAILS REAL EMPOWERMENT FOR VALLEY RESIDENTS." IS THIS TO SUGGEST THAT YOU VIEW REAL EMPOWERMENT AS A NECESSARY GOAL WITH REGARD TO THE TENNESSEE VALLEY AUTHORITY?

b. WHAT, IN YOUR VIEW, CONSTITUTES ACCOUNTABILITY, AND IS THIS AN IMPORTANT CONCEPT WITH RESPECT TO TVA? IS IT IMPORTANT FOR THE CITIZENS OF THE TENNESSEE VALLEY TO HAVE A VOICE IN THE DECISIONS THAT THEY WILL ULTIMATELY BE ASKED TO PAY FOR?

c. YOU MAKE SOME SPECIFIC SUGGESTIONS WITH REGARD TO THE NOTION OF ACCOUNTABILITY. COULD YOU PLEASE ELABORATE ON THESE AND SUGGEST HOW THEY WOULD WORK?

2)a. ONE OF THE MOST INTRIGUING SUGGESTIONS WHICH YOU MADE IN YOUR TESTIMONY COMES AT THE VERY END. YOU STATE, "IT IS ENTICING TO WONDER...WHETHER INFORMED CITIZEN INVOLVEMENT AT THE EARLIEST STAGES OF TVA'S NUCLEAR BUILD-UP WOULD HAVE SERVED AS A CHECK ON SOME OF THE KEY ASSUMPTIONS THAT TVA MADE TO JUSTIFY WHAT TURNED OUT TO BE A WASTEFUL EXERCISE." OBVIOUSLY, YOU HAVE DEVOTED SOME THOUGHT TO THIS, AND I WONDER IF YOU WOULD SHARE WITH THE SUBCOMMITTEE HOW THE DECISIONS WHICH WERE MADE WOULD HAVE BEEN DIFFERENT HAD THERE BEEN MORE PUBLIC PARTICIPATION IN THE PROCESS?

b. SIMILARLY, HOW WOULD OTHER OF TVA'S EXCESSES BEEN DIFFERENT HAD THERE BEEN AN OPPORTUNITY FOR INCREASED PUBLIC PARTICIPATION?

3)a. IN YOUR TESTIMONY, YOU SUGGEST THAT THE BASIC CHANGE IN TVA'S APPROACH APPEARS TO BE A FUNCTION OF THE NEW BOARD OF DIRECTORS WHICH CAME TO POWER IN THE LATE 1970'S, AND YOU STATE THAT IT APPEARS THAT THE PRESENT BOARD APPEARS COMMITTED TO THE NEW DIRECTION OF THE AGENCY. GIVEN THE PAST EXPERIENCE OF TVA, IS IT NOT CONCEIVABLE THAT WITH A SUBSEQUENT CHANGE ON THE BOARD OF DIRECTORS, THEN TVA'S POLICIES WOULD AGAIN SHIFT DIRECTIONS?

b. WHAT ASSURANCES CAN WE EVER HAVE THAT THIS WILL NEVER BE THE CASE?

4)a. IN A PAPER PUBLISHED IN THE TENNESSEE LAW JOURNAL TWO YEARS AGO, YOU SPOKE OF THE "MODERN DAY DISSONANCE BETWEEN THE AGENCY'S DEMOCRATIC RHETORIC AND ITS ACTIONS." COULD YOU ELABORATE FOR THE SUBCOMMITTEE ON THIS THOUGHT. SPECIFICALLY, IS TVA A DEMOCRATIC INSTITUTION? HOW FAR BEYOND COSMETIC PARTICIPATION MUST TVA GO TO REDUCE THIS DISSONANCE?

b. HOW HAS THIS DISSONANCE BEEN RECONCILED IN THE PAST? YOU HAVE WRITTEN AT LENGTH ABOUT THE IMPORTANCE OF THE COURTS IN SERVING AS A MEANS TO ENSURE ACCOUNTABILITY AT TVA. IS THIS AN APPROPRIATE AND EFFECTIVE MEANS TO ENSURE ACCOUNTABILITY IN AN INSTITUTION WHICH SO FERVENTLY CLAIMS TO HAVE ITS ROOTS IN DEMOCRACY?

SENATOR HUMPHREY
Continued

5)a. IT IS MY UNDERSTANDING THAT YOU ARE PRESENTLY REPRESENTING A BROAD-BASED CITIZENS GROUP--THE TENNESSEE VALLEY ENERGY COALITION--IN A SUIT AGAINST THE TENNESSEE VALLEY AUTHORITY. COULD YOU TELL US THE NATURE OF THE SUIT?

b. HOW DOES CONSTRUCTION WORKS IN PROGRESS CHARGES RELATE TO TVA'S ACCOUNTABILITY? HOW MUCH IS IT ESTIMATED THAT SUCH CHARGES HAVE COST CONSUMERS IN THE TENNESSEE VALLEY?

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RESPONSES TO QUESTIONS FROM SENATOR HUMPHREY

1. I view "real empowerment" as a necessary goal for public involvement with all governmental agencies, not just the Tennessee Valley Authority. In view of TVA's insular decisionmaking processes prior to the mid-1970's, the agency had a great deal of catching up to do in the area of meaningful public participation. Such involvement is even more important in an agency that is not governed by the Administrative Procedures Act and other mechanisms for formal public participation.
1. I think that it is extremely important for the citizens of the Tennessee Valley to have a voice in all major TVA decisions. As I stated in my oral testimony, the concept of accountability is a very complex and dynamic one. As I also stated in response to question 1A, the less accountable an agency is under the formal channels created by Congress and the courts, the greater the need for citizen involvement in agency decisions.
1. As you are aware, there is a huge literature on the issue of citizen participation and agency accountability. These mechanisms range from the creation of a independent Citizens' Advocate Office, an Inspector General's office, extensive involvement by informed Advisory Committees in TVA decisionmaking, etc. One mechanism that makes sense for an institution like TVA is the creation of a Citizens' Advocate Office funded by voluntary contributions by TVA ratepayers. This is a concept that has been used with some success in some states. The basic idea would be to permit ratepayers to check off on their utility bills a box that would indicate their willingness to pay a very minor sum per month toward the workings of a Citizens' Advocate Office. Presumably, the more effective such an office promises to be, the greater the contributions. Conversely, if the office turns out to be ineffective, it will not receive the kind of sustaining contributions that it would need. Obviously, such an approach would require assurances that the Citizens' Advocate Office is, in fact, accountable to the citizens that it serves. I believe, however, that the approaches in other states have dealt with this issue.
2. The major problems that TVA is encountering in its nuclear program have their roots in the late 1950's and 1960's when key decisions were made to proceed with a 17 reactor program.

Part of the justification for this massive program rested on projections as to future demand for electricity. These projections, in turn, rested on a number of assumptions about growth and electricity use in the Tennessee Valley. In my opinion, assumptions such as these need to be fully tested, not just by experts but by ordinary citizens whose views on such underlying issues often conflict with the approaches taken by experts.

I would like to see more public involvement in many aspects of TVA's power program. The financing of TVA's program, for example, is a conundrum to all but a few rate payers. Similarly, the process that TVA uses to decide whether to construct new generating facilities has, in the past, been a very closed one. To avoid the kind of problems that TVA is now experiencing, I would like to see the agency develop creative mechanisms for involving citizens in the process of making these type of projections. I should caution that I am not sufficiently familiar with the experience of the nuclear industry as a whole to know whether TVA's projections were significantly different from the ones of other utilities. Regardless, the answer would not be to exonerate TVA but to indict the entire industry for their failure to include a range of diverse views in deciding whether to proceed with massive capital expenditures.

2. I would imagine that increased public participation at the earliest stages would have curbed TVA's resistance to air pollution controls. Certainly, this was true after the fact.
3. Yes.
3. Probably none, except the type of institutionalized public participation that is discussed above.
4. To this day, the early years of TVA represent a profound experiment in American government. One only needs to travel abroad to appreciate the symbolic importance of TVA as a democratic institution. TVA's problem, as has been the case with other governmental institutions, is that it failed to heed the aspirations of its founders following the flush of success during the agency's early years. The literature on TVA in its early years is replete with good ideas about American government. Why many of these ideas were never realized would be the subject of a fascinating study. I am always reminded of Robert Caro's book, *The Power Broker*, a rich account of the life of Robert Moses, the czar of public works in New York City. Much like TVA, his works were acclaimed as representing progress at the time they were carried out but criticized later for their shortcomings of vision. Much the same change in perceptions has afflicted TVA.

4. The use of litigation and the courts to ensure accountability has, in my opinion, been an important part of the checks and balances that TVA decisionmakers have taken into account. I, for one, feel that the use of courts to achieve social aims is as much a part of the fabric of our democracy as the passage of legislation or the promulgation of regulations. It must be remembered that it was Congress that originally created the citizens' suit mechanism, a creation that has endured quite successfully for the past fifteen odd years. Through citizens' suits, issues often get the type of public attention that could never be achieved in agency deliberations. Although litigation should not be a preferred course, it is one that can and should not be ignored in looking at TVA's history. If anything, avenues for citizen access to the courts to challenge TVA policies should be broadened.

5. In *TVEC v. TVA*, which is currently pending before the United States District Court of the Middle District of Tennessee, I am representing a grassroots consumer organization in a challenge to TVA's policies and practices governing the allocation of the costs of construction of large capital projects between present and future TVA consumers. Essentially, the suit revolves around an interpretation of the TVA Act and Bond Resolution. TVA takes the position that it has no discretion not to pass all interest costs onto present day consumers, even though the plants for which these costs are incurred are not providing electricity to the system. TVEC's position is that the TVA Act gives TVA substantial latitude in determining how much and whether to pass these costs along. TVEC has suggested that much of the interest charges could be capitalized and paid for by future TVA consumers who benefit from electricity. TVEC was joined in this suit by the Tennessee Valley Industrial Coalition, a collection of large industries in the Valley. This CWIP (construction work in progress) issue has been a controversial one around the country, and this suit was designed to compel TVA to deal with the CWIP issue in a more open and informed manner. Although the principle involved in the suit is still alive, the decision of the agency in recent years to cancel or defer a number of the large nuclear projects has blunted the significance of this issue. It could, however, arise again in the future.

5. I do not have at hand the exact CWIP charges. I do know that when the lawsuit was filed in 1981, CWIP charges were close to two billion dollars per year. CWIP, which is an important part of TVA's financing, should be subject to the same type of accountability as other aspects of the agency's power program.

QUESTIONS TO DEAN RIVKIN FROM SENATOR BURDICK

- 1) Mr. Rivkin, you seem to be saying in your written testimony that TVA's various citizen input devices go a long way towards making the agency accountable to the people. Am I to understand then that you think that no structural changes are needed to keep TVA accountable?
- 2) What is the Valley Environmental Network? How does it work?
- 3) Are TVA's efforts at strip mine reclamation adequate or should they be stepped-up?

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RESPONSES TO QUESTIONS FROM SENATOR BURDICK

1. I do not think that any major structural changes are needed to keep TVA accountable. Within its present structure, there are numerous possibilities for meaningful citizen involvement. It is a matter of the agency seizing these opportunities and making the most of them. I do not see any significant structural barriers to prevent this from happening.
2. The Valley Environmental Network (VEN) is an outgrowth of the Citizens' Implementation Committee that monitored the progress of the air pollution consent decree. It is composed of individuals representing major environmental interests in the Tennessee Valley. Presently, VEN is working closely with TVA's Environmental Quality staff in specifying issues that will be the subject of future attention by TVA. The network is a loosely knit coalition that has a volunteer coordinator. It is hoped that, as a working relationship with the TVA environmental quality staff develops, VEN will provide effective channels for citizens to help shape TVA's priorities concerning the environment.
3. In my opinion, TVA's efforts at strip mine reclamation should be significantly bolstered. As a major coal purchaser in this region, TVA should play an important role in affecting the practices of the coal industry. Within the past month, TVA announced a stepped up program of inspections and enforcement that represents a step in the right direction.

W/TH/A

ENVIRONMENTAL POLICY INSTITUTE

TESTIMONY OF DR. BRENT BLACKWELDER, DIRECTOR OF WATER RESOURCES,
ENVIRONMENTAL POLICY INSTITUTE BEFORE THE SENATE ENVIRONMENT AND
PUBLIC WORKS SUBCOMMITTEE ON REGIONAL AND COMMUNITY DEVELOPMENT
ON JULY 30, 1985

The Environmental Policy Institute is a national conservation organization which specializes in water, energy, and agricultural issues. We appreciate the opportunity to testify on this oversight hearing on the Tennessee Valley Authority, and wish to commend the Subcommittee for conducting such hearings. The Environmental Policy Institute sponsored the pioneering analysis of William U. Chandler on TVA which was published as a book The Myth of TVA in 1984. This testimony is divided into four major parts: first, a discussion of the problems with TVA's dam building approach as a model for international economic development; second, a discussion of the Tellico Dam Project; third, a discussion of the Duck River Project; and finally a commendation of TVA's policy of curtailing stream channelization. The second and third parts illustrate the need

to end TVA's self-authorizing power for water projects, which is the major recommendation of this testimony.

TVA as a Model for International Development.

TVA approached the goal of improving the quality of life and the economy in the Tennessee Valley with a plan of building dams to harness floods, produce energy, and provide navigation and water supply. Chandler demonstrates in his book that navigation and flood control after 50 years really did not pay for themselves under realistic economic accounting. The strategy of damming a major river and drowning out the rich flood plain farmland is a poor one as we look to the Third World's need for food production. TVA is touted as an international model of development for the Third World to copy. With respect to the dam building plan as a strategy the Environmental Policy Institute believes that this model is badly flawed. Recent publications on the impacts of extensive international dam building have shown catastrophic results. These dams in the Third World can:

- 1) Increase the spread of diseases such as malaria, schistosomiasis, and onchocerciasis (river blindness). In warm climates reservoirs, both large and small, have created favorable

habitats for the breeding and survival of the mosquitos, snails, and black flies which transmit these serious diseases. These diseases have made such a surprising resurgence as a result of large development projects that Ecoforum reported:

"Malaria which vanished in the post-war in India has made a comeback and with such a ferocity that more than 8 million people...were affected last year...Many people ask how could malaria be back after so many years? How could there be schistosomiasis in areas where there was none before?...the return of all these diseases directly relates to the creation of favorable habitats for their breeding and survival. And these habitats largely relate to the development efforts of nations such as by erecting dams, creating vast water reservoirs and digging irrigation canals where mosquitoes can survive and the schistosomiasis harboring snails survive." (Ecoforum, December, 1982)

2) Create reservoirs which will fill with sediment in less than a century. The lifespan of reservoirs throughout developing countries is being greatly shortened as a result of upland deforestation in the watershed and of poor analysis of the sediment load prior to construction. As a result productive forest and farm valleys are being drowned for a relatively short-term venture.

3) Have significant engineering, safety or operational problems. The serious engineering and operation problems besetting major international dam projects are not well-known. The failure rate of dams worldwide is almost one percent, a shockingly high rate which would never be tolerated in the United States.

4) Inundate areas of special environmental, scientific, or educational importance. Dams in the Third World, as in our own country, have threatened national parks, wildlife refuges, archeological sites, and endangered species.

5) Displacement of rural people from their homes, especially indigenous tribal peoples. Between 1969 and 1978 water projects funded by the World Bank displaced 178,000 members of tribal groups from their native lands. These people are not provided

adequate resettlement, are ravaged by disease, and are spiritually destroyed by removal from the land to which they are attached.

6) Creation of water quality problems. Inundation of tropical forests has created stagnant reservoirs with massive releases of hydrogen sulfide. Dams impede the downstream flow of nutrients and can drastically alter the ecologically balance in estuaries. The Tucuruí Dam in Brazil has this year begun to impound water and drown 760 square miles of tropical forest, causing enormous fish kills and foul air quality from decaying animals and vegetation.

One important point which we hope these hearings could bring out is that the water development/dam building approach to river basins is not the best development strategy, that it is filled with numerous problems, and that it never produced the benefits claimed for it. In fact, pushing the high technology of dams throughout the Third World has even less chance for success in societies not technically advanced and with quite different needs and ecosystems. The spread of diseases by dams in warm climates is one significant impact not experienced in the United States and illustrates the dangers of blind export of our technology.

Need to End the Self-Authorization Powers for Water Development.

The remainder of this testimony is devoted to a discussion of two TVA recent dam projects which illustrate the need to end the ability of the agency to self-authorize projects. Indeed, the fundamental recommendation we wish to make is for the curtailment of TVA's self-authorizing power. The Senate Environment and Public Works Committee should have the power to authorize any new water development projects of the TVA and should not abdicate this responsibility to the Appropriations Committee.

Tellico Dam. The Tellico Project is famous through its connection with the snail darter. Unfortunately, preoccupation with the snail darter obscured consideration of such fundamental questions of such as the economic feasibility of the dam, the impact on nationally significant archeological treasures, and the social disruption involved in inundation of productive agricultural valleys. The Tellico Project was completed at a cost of \$120 million. Tellico drowned out a valley which archeological experts

considered one of the most important in North America. The valley was the site of the oldest continuous habitation on the continent and contained the ancient Cherokee village of Tanasi from which the state Tennessee derives its name. In its free flowing state the river provided abundant fishing and boating opportunities. The General Accounting Office report on the Project found that although it was 95% complete, the economics were so bad that it did not pay to finish it. That should say something about the original design.

About 16,500 acres of prime bottomland was lost and farmers and elderly people were moved from their homes to make way for the project. The original justification for the project was to provide a reservoir for a new town and industrial development; however, the Boeing Corporation pulled out the project in the early stages. Notwithstanding the withdrawal of the major new town developer, TVA pursued the project, pushed on by local politicians.

The fundamental economic rationale is at odds with our generally accepted concept of the federal government's function in a free society governed by market principles. The economic rationale of the dam consisted in evicting valley residents from

their homes and farms, building the reservoir, and then reselling land around the reservoir at a profit. Is this really the role for a federal agency?

Many Tennessee organizations fought desperately to convince TVA to pursue an alternative plan for the valley. These organizations included the Tennessee Conservation League, the Tennessee Council of Audubon Chapters, the Tennessee Citizens for Wilderness Planning, the Tennessee Chapter of the Sierra Club, the Smoky Mountains Hiking Club, and Trout Unlimited. These citizens argued that 16,500 acres of prime farmland were a priceless asset that should continue in farming. Recreational uses such as canoeing, fishing, hiking, hunting, backpacking, nature study, camping, and horseback riding could easily be met throughout the valley. The preservation of historic and archeological sites would constitute an important attraction for the region while conserving our nation's heritage.

It should be pointed out that ultimately Congress stepped into the controversy and exempted this project from existing laws, thereby allowing the dam to be finished and this historic valley drowned.

The Duck River Project: Normandy and Columbia Dams

The Duck River Project also illustrates TVA's disregard of environmental concerns and willingness to push an uneconomic project with many adverse impacts. TVA initially pursued the Duck River Project even though it was uneconomic according to its own benefit-cost analysis. This analysis itself was a piece of legerdemain containing such highly dubious claims as counting the cost of replacing bridges to make way for the reservoir as a benefit rather than a cost.

Now the Normandy Dam has been completed, but construction work on Columbia has been halted. The Duck River carries such a heavy nutrient load that when impounded it creates a stagnant reservoir. Local residents who now have to use Normandy reservoir water complain regularly of its awful taste. The exceedingly foul water from Normandy has been collected by local conservationists in a fundraising effort and bottled and sold under the label "Columbia Dam Scum", a foul smelling brew that would make MacBeth's witches proud.

The Duck River Project was named in March of 1973 as one of the 13 worst water development proposals in the nation in a

publication "Disasters in Water Development", sponsored by thirteen major national conservation organizations. Despite national environmental objections and despite objections from local farmers and conservationists construction of the Columbia Dam was initiated in August of 1973.

Columbia Dam, however, came under severe scrutiny first by the Carter Administration and then by the House Government Operations Committee. The Committee's hearings and subsequent report of December 11, 1980, revealed that TVA's own staff had identified a non-dam alternative which would accomplish project purposes cheaper at a fraction of the cost.

Here are the basic facts about Columbia Dam. It would inundate 54 miles of the scenic Duck River, creating a reservoir whose fluctuations would be so enormous that thousands of acres of mudflats would be exposed for six months of the year. The dam would destroy 27,000 acres of farmland and wildlife habitat.

Originally projected to cost \$50 million in 1973, the price tag currently is \$240 million. The dam would not produce hydropwer or provide navigation. The primary purpose is recreation which comprised 60% of the benefits; yet the Committee

noted that there are many recreational reservoirs within a short drive and the river itself affords numerous recreational opportunities which could be developed.

From an environmental standpoint the Duck River contains rich and diverse wildlife habitats, including that of the wood duck for which the river is named.

The Government Operations Committee concluded that "completion of the Columbia dam and reservoir is not in the public interest." Furthermore, the Committee noted:

"The original project benefits can be obtained without the dam, without destroying 54 miles of river, without eliminating 13,000 acres of farmland and at a favorable benefit/cost ratio. Those project benefits under the no-dam alternative can be obtained for \$15 to \$25 million--compared to the \$78 million needed (in 1980) to complete the planned Columbia dam and reservoir." (p. 104 House Report No.96-1533 TVA's Columbia Dam Project on the Duck River in Tennessee)

Finally, the Government Operations Committee commented on the failure of TVA to abide by the law:

"TVA has ignored a number of responsibilities entrusted to it by Congress. It ignored federal statutes calling for the good faith sharing of information with other federal agencies so that they might discharge their own statutory duties. In so doing, it fostered a debilitating atmosphere of mistrust among agencies inconsistent with the cooperation necessary for fair consideration of all the interests and values associated with a major water project. TVA repeatedly showed a disregard for its fundamental responsibility to American taxpayers to spend their tax dollars wisely." (p.108)

The Environmental Policy Institute believes that the attitude of TVA toward major water development has changed in recent years; nevertheless, the history of the Tellico and the Duck River projects make clear the desirability of terminating

the self-authorizing power of TVA for water resource development and putting the agency on the same footing as the Army Corps of Engineers which must come before this Committee for authorization of its projects.

TVA's Stream Channelization Guidelines

On October 18, 1983 TVA's Directors approved an excellent policy governing modifications of streams and creeks. TVA announced its intention to avoid to the greatest extent possible further channelization or environmentally degrading structural modifications of streams in the Tennessee Valley and other regions subject to TVA actions. The policy document states further:

"TVA strongly encourages State and local governments to consider and utilize action alternatives which do not involve stream modification. TVA assists State and local governments in identifying these alternatives and may provide further technical and financial assistance in implementing actions conforming to this policy."

Conclusion

We appreciate the opportunity to testify and are submitting additional material to the Committee on the points we raised.

ENVIRONMENTAL POLICY
INSTITUTE

August 2, 1985

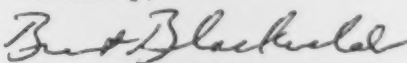
Senator Gordon Humphrey
Chairman
Subcommittee On Regional
& Community Development
Washington, D.C. 21510

Dear Mr. Chairman:

We appreciated very much the opportunity to testify on TVA this week and wish to express our gratitude to you for holding these oversight hearings.

We wish to submit the following items which are attached for the hearing record: TVA's stream channelization guidelines; a flood damage graph for the nation; and finally, a summary and table of contents of the most recent comprehensive review of the impact of large dams worldwide.

Sincerely,


Brent Blackwelder

NATIONAL SCIENCE FOUNDATION

A REPORT ON FLOOD HAZARD MITIGATION

SEPTEMBER 1980

This graph shows the failure of federal flood control expenditures to curb the growth of flood damages. Some experts contend that the present emphasis on structural methods of flood control actually enhance flood damages.

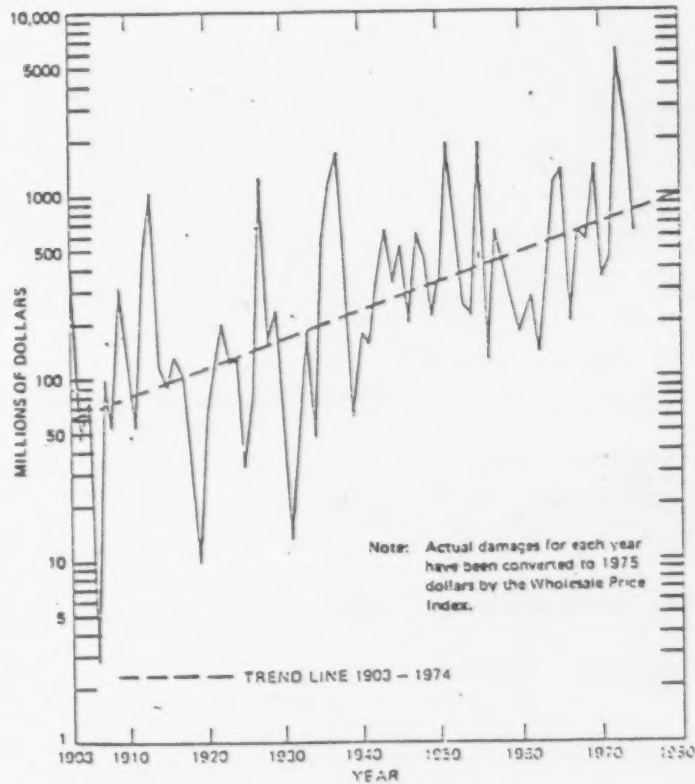


Figure 1. Flood Loss Estimates for the United States

**CHANNELIZATION, STRUCTURAL MODIFICATION, AND RENOVATION OF
WATERS SUBJECT TO TVA ACTIONS**

The Board of Directors approved the following policy and reservations on October 18, 1983.

Policy

TVA's unified development of the Tennessee River Basin through a multiple-purpose water control system has undergone a transition from building and developing the physical system of dams and reservoirs to a role of maintaining and improving the system and managing the associated water resources for maximum benefit of the Valley. The remaining reaches of free-flowing streams of the Valley are integral to the realization of these benefits.

TVA recognizes that channelization and some actions involving structural modification or renovation of these remaining stream reaches may, individually or cumulatively, unacceptably damage naturally functioning aquatic ecosystems in the affected reaches.¹ The preservation of these ecosystems and a halt to the continued diminishment of total natural stream values in the Valley and the Nation are important to ensuring a healthful and productive human environment. Therefore, it is TVA policy to avoid further channelization or environmentally degrading structural modification or renovation of applicable water² within the Valley or other regions subject to TVA actions except where both significant public benefits are clearly established and environmental damage can be avoided or substantially mitigated. Stream renovation necessary because of poor land management practices will be undertaken only when it is satisfactorily demonstrated that adequate soil erosion controls are being implemented within the pertinent hydrological unit. All actions listed below to which this policy is applicable are reviewed under established procedures as set forth in TVA Instruction IX ENVIRONMENTAL REVIEW. However, actions identified below to which the policy is not applicable are not exempted from appropriate review under these procedures.

This policy is applicable to the following activities:

- Construction or modification of TVA facilities, including power plants, transmission lines, disposal and storage areas, buildings, mines, and associated facilities.
- Management of lands under TVA control, including dam and power plant reservations, reservoir lands, lands held for mineral rights, Land Between The Lakes and other wildlife/natural area lands, reservoir margins, and agricultural lands.
- Actions, other than for flood control, undertaken by other agencies, institutions, corporations, or individuals which receive TVA funding, permits, or assistance.
- Water management activities for purposes other than those exempted below.

1. Channelization: The alteration of the natural morphology of a stream to increase volume or the rate of flow through increasing the depth or width or by straightening or relocating the channel.

Structural Modification: Construction or placement of dams, weirs, dikes, earthfills, substrate linings in streams and extensive riprapping in or adjacent to streams.

Renovation: The clearing of stream blockage which is caused by vegetation, beaver dams, debris, or erosion-caused sedimentation, such that the natural flows and stream configuration are restored.

2. Applicable Waters: All perennial streams having sustained aquatic life or with flow regimes sufficient to potentially sustain aquatic life.

IXSTREAM MODIFICATION

This policy does not apply to:

- Stream modification and renovation actions designed to protect or enhance natural stream values or inherent environmental attributes (for example, Clinch River reregulation weir).
- Actions which are taken to control flood or streamflow damage to essential structures or land uses. See TVA Code XII FLOOD CONTROL.
- Additions, modifications, or routine maintenance of existing dams and impoundments (for example, development or maintenance of navigation channels; installation of electric generating facilities in existing dams).
- Temporary stream modification to permit construction activity.
- Installation of intake and discharge structures requiring limited streambank modification or riprapping.
- Construction of bridge piers or abutments.
- Channel maintenance on previously modified watercourses on construction and power plant sites and renovation actions currently conducted on a routine basis necessary for public safety and vector control or to protect existing facilities (for example, frequent removal of storm debris from streams near power facilities).

TVA strongly encourages State and local governments to consider and utilize action alternatives which do not involve stream modification. TVA assists State and local governments in identifying these alternatives and may provide further technical and financial assistance in implementing actions conforming to this policy.

Reservations

The Board of Directors approves proposed actions which involve significant policy or program considerations.

The General Manager approves guidelines for general application within TVA issued under the policy.

Delegations

See delegations related to the National Environmental Policy Act under TVA Code IX ENVIRONMENTAL QUALITY.

**The Social
and
Environmental Effects
of Large Dams**

by

Edward Goldsmith and Nicholas Hildyard

Volume One: Overview

A Report to
The European Ecological Action Group (ECOROPA)

107 Rue de la Course, Bordeaux 33000, France
Fach Henbant, Crickhowell, Powys, Wales, UK

Foreword

by

Brent Blackwelder, Ph.D., Director of Water Resources
at the Environmental Policy Institute

Popular thinking is that big dams are a great economic and social benefit because they produce clean power, stop damaging floods, and help combat world hunger by providing water for irrigation. Edward Goldsmith and Nicholas Hildyard have pulled together an unparalleled assemblage of data demonstrating that big dams and water projects have not only failed to achieve those basic objectives but are also leaving a legacy of unsurpassed cultural destruction, disease, and environmental damage. This remarkable study of large water development schemes from around the world shows the dramatic difference between the rhetoric of project promoters and the grim reality of the superdams.

Goldsmith and Hildyard present telling evidence of the extensive range of problems which large dams have caused throughout the world - from engineering mistakes and operational errors to severe social dislocation and the spreading of disease; to the elimination of forests and significant wildlife habitats; to the destruction of estuaries and endangered species; to the ruination of the very land designed to be made productive. Because the pace of large-scale dam building is increasing exponentially, it is imperative that industrialised nations take the warnings in this book to heart. The case against irreversible manipulation of river systems on a global scale is so overwhelming that we proceed with funding of these superdams at our own peril.

A significant percentage of water development in the United States has been a sad mistake, but developing countries seem intent on replicating our mistakes. America's Tennessee Valley Authority is often held up as a model of how to make the economy of a valley

flourish. In fact, people from all over the world come to see what TVA has done. Unfortunately, the TVA story is really a myth. The Environmental Policy Institute's analysis of the costs and benefits experienced by TVA's water projects during its first 50 years showed that the flood control and navigation objectives have yet to pay for themselves by any reasonable standard of accounting. Furthermore, areas in the Southeastern United States which did not receive financial aid from TVA did as well as or better than the TVA region, even though they were as poor, or poorer, to begin with.

One outstanding feature of Goldsmith and Hildyard's work is the discussion of ancient or traditional irrigation societies, whose sustainability over centuries stands in stark contrast to the short-lived, poorly designed irrigation projects which industrialised countries have funded throughout the Third World.

The staggering array of problems created by large-scale water development is so alarming and widespread that an international network has been established to halt the destruction and to propose sensible alternatives. Goldsmith and Hildyard's book stands as a landmark in providing the most comprehensive information and analysis to date on the tragic impacts of the superdams.

Washington DC, 1984

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A Ballad of Ecological Awareness

Foreword by Brent Blackwelder

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ENVIRONMENTAL POLICY INSTITUTE

RESPONSES TO QUESTIONS FROM SENATOR HUMPHREY
FOR THE HEARING RECORD ON THE TENNESSEE VALLEY AUTHORITY

1. Questions on Tellico and Columbia Dams.

- a. 38,000 acres of land were taken for the Tellico Project, of which 16,000 acres of prime farmland were inundated by the reservoir itself.
- b. Several hundred people were evicted to make way for the Tellico Project. 340 families were moved.
- c. These people are now scattered, and as far as we can tell are mostly not employed by the Project and its associated facilities.
- d. The people of the valley were initially at a disadvantage because TVA did not have to get the Tellico Project authorized. TVA simply went straight to the appropriations committees and came away with funding. Citizens tried to organize but the TVA Board was unsympathetic. Relief was then sought in the courts.
- e. The Tellico experience tells us that TVA's self-authorizing power for water projects should be ended. This would make the TVA Board more accountable in this area and it would afford citizens a fair chance to present their views in the process normally followed for Army Corps of Engineers and Bureau of Reclamation projects.
- f. TVA staff developed an alternative plan for the valley which involved no dam but which produced more benefits. The Endangered Species Committee substantiated this plan. However, due to political pressure TVA never circulated the plan very widely. Furthermore, even after the Supreme Court ruled against the project, TVA would not allow farmers to move back on their land, nor did TVA talk about the non-dam plan it had prepared for the valley. Finally, Congressman Duncan placed a rider on an appropriations bill exempting Tellico Dam from all laws.
- g. Tellico has not been a successful project. 40,000 jobs were promised but fewer than 100 jobs now exist, none of which require a reservoir as opposed to a river. So if the question is put as to what benefits exist because a reservoir is present rather than the non-dam plan, the answer is that there are no such job or industrial benefits. What industry has come to the valley because of the reservoir that wouldn't have otherwise, especially if land is being given away?
- h. The people at TVA who promoted the Tellico Project, in particular the Board members are now gone, so there is no individual to be held accountable at TVA now. The only option open to citizens would be to petition the Congress or the new TVA Board to lower the reservoir gradually and reclaim the valley for farming and other activity envisioned in the non-dam plan.

i. Yes, it is true that TVA staff recommended an alternative non-dam plan in lieu of Columbia Dam. This alternative would produce all the benefits claimed for the dam at about one quarter the cost. The alternative consisted in developing river oriented recreation along the Duck River, using the upstream Normandy Dam for water supply releases, and putting non-structural flood control measures in place in Columbia. The House Government Operations Committee has analyzed this non-dam alternative and recommended strongly that TVA pursue it.

j. Congress can have a major say in the disposition of Columbia Dam. The Senate Environment and Public Works Committee in particular could direct TVA to pursue the non-dam alternative in lieu of the original dam itself. The Environmental Policy Institute urges that such a directive be given to TVA.

k. Chandler's assessment is correct. Having publicly tooted the horn of Tellico Dam, TVA got Congress excited. Without the accountability to stockholders, it was no skin off TVA's back to push ahead with the project at taxpayer expense. Thus, TVA could pursue the project knowing that it was uneconomic whereas a private company would not have an interest in deluding itself about the financial feasibility of an undertaking since it is stuck with the financial consequences. The nation's taxpayers and the former residents of the Tellico valley are saddled with the consequences of the dam.

2) An authorization process for TVA would involve the following:

- a. TVA would submit a feasibility report on a proposed water project to the Senate Environment & Public Works Committee and to the House Public Works & Transportation Committee.
- b. These two Committees would analyze the report and authorize the project with legislation if it met the Committee standards for water projects.
- c. The House and Senate as a whole would then act on the authorizations for TVA reported from the two Committees.
- d. Only after authorizing legislation became law would projects become eligible for appropriations. This is the standard process for Army Corps of Engineers and Bureau of Reclamation projects. This arrangement would bring needed Congressional oversight into the process at a much earlier stage and would produce a greater degree of accountability on the part of TVA.

3) The matter of international exchanges with TVA is very serious because our analysis casts doubt on the wisdom of the dam building model for river basin development. The evidence of 50 years of TVA water projects suggests that this is a poor method for economic development and that we are leading Third World countries down a ruinous path.

Thus, foreign exchanges for the purpose of touting the TVA river development model should be terminated. On the question of other types of exchanges with countries around the world EPI takes no position. Our central point is that pursuing the TVA dam building model is going to get Third World nations in serious debt, cause them to sacrifice prime farm and forest land, and produce a host of problems not usually found with reservoirs in northern climates.

Respectfully submitted,

Brent Blackwelder

Brent Blackwelder
Director of Water Resources

QUESTIONS FROM SENATOR HUMPHREY TO DR. BRENT BLACKWELDER

1) THE THRUST OF YOUR TESTIMONY CENTERS ON TWO OF TVA'S MOST QUESTIONABLE PROJECTS IN THE RECENT PAST--THE TELlico AND COLUMBIA DAMS. I HAVE A SERIES OF QUESTIONS RELATED TO THESE PROJECTS.

a. WITH REGARD TO TELlico, IT IS MY UNDERSTANDING THAT SOME OF THE FARMLAND WHICH WAS LOST WAS AMONG THE BEST IN THAT AREA. IS THIS TRUE?

b. DO YOU KNOW HOW MANY PEOPLE WERE EVICTED FROM THEIR LAND TO MAKE WAY FOR THE TELlico PROJECT?

c. WHERE ARE THOSE PEOPLE NOW?

d. WHAT RECOURSE DID THE PEOPLE OF THE TELlico AREA HAVE IN FIGHTING THE PROJECT?

e. WHAT DOES THE TELlico EXPERIENCE TELL US ABOUT THE TVA'S DECISION-MAKING PROCESS?

f. IT IS MY UNDERSTANDING THAT TVA STAFF EVEN RECOMMENDED AGAINST PROCEEDING WITH THE PROJECT, BUT THAT MANAGEMENT PRESSED TO FORGE ON. ARE YOU AWARE OF THIS?

g. HAS TELlico BEEN A SUCCESSFUL PROJECT?

h. WHO SHOULD BE HELD ACCOUNTABLE FOR TELlico? WHO CAN THE PEOPLE OF THE AREA GO TO HOLD RESPONSIBLE FOR THIS PROJECT?

i. WITH REGARD TO COLUMBIA DAM, IT IS MY UNDERSTANDING THAT AGAIN, TVA STAFF RECOMMENDED ALTERNATIVES OTHER THAN THE PROPOSED PROJECT. IS THIS TRUE?

j. THE PROJECT HAS BEEN IN LIMBO FOR SEVERAL YEARS. WHAT FACTORS WILL LEAD TO THE ULTIMATE DISPOSITION OF THE COLUMBIA DAM MATTER?

k. DR. BILL CHANDLER, IN HIS BOOK "THE MYTH OF TVA", WRITES, "THE BEHAVIOR OF THE PAST AND CURRENT CHAIRMEN OF TVA, DAVID FREEMAN AND CHARLES DEAN IS VERY INSTRUCTIVE ON THE SUBJECT OF TVA'S "FLEXIBILITY OF A PRIVATE CORPORATION." A PRIVATE CORPORATION HAVING FOUND ITSELF WITH A LOSING PROPOSITION WOULD CUT ITS LOSSES AND TERMINATE A PROJECT. A PUBLIC CORPORATION SUCH AS TVA FINDS THAT LIFE IS NOT SO SIMPLE." DO YOU AGREE WITH THIS STATEMENT?

2) YOU SUGGEST THAT A MEANS OF AVOIDING POOR DECISIONS SUCH AS COLUMBIA AND TELlico WOULD BE TO BRING TVA UNDER THE AUTHORIZATION PROCESS. COULD YOU OUTLINE IN DETAIL HOW THIS WOULD WORK, AND HOW SUCH AN ARRANGEMENT WOULD BE AN IMPROVEMENT OVER THE PRESENT PRACTICE? WOULD THIS INTRODUCE ACCOUNTABILITY INTO TVA'S DECISIONS?

3) I AM INTERESTED IN YOUR PROPOSITION THAT TVA SHOULD NOT BE A MODEL FOR ECONOMIC DEVELOPMENT. INDEED, TVA IS FOND OF TELLING US OF HOW MANY INTERNATIONAL EXCHANGES THEY PROMOTE TO EXPORT THE TVA EXPERIMENT. YOU WOULD PROPOSE THAT SUCH EXCHANGES BE TERMINATED? ARE YOU SUGGESTING THAT TVA COULD SERVE AS A MODEL FOR HOW NOT TO DEVELOP A WATERSHED AREA?

ENVIRONMENTAL POLICY INSTITUTE

RESPONSES TO QUESTIONS FROM SENATOR BURDICK

FOR THE HEARING RECORD ON THE TENNESSEE VALLEY AUTHORITY

1. According to the work of William U. Chandler, the majority of TVA's main dams have been uneconomic when their actual performance over 50 years is examined. Thus, from an economic standpoint the Valley would have fared better had a different set of investments been made. For example, investment in nonstructural flood control measures would, we maintain, have been more successful in reducing flood damages.

2. EPI has never asserted that the benefits of dams never exceed their costs. Chandler's analysis itself suggests that several TVA dams did have benefits in excess of costs. The Hoover Dam had significant hydroelectric power benefits and economic payout. EPI suggests four basic criteria for evaluating dams:

- a. economic feasibility
- b. social acceptability
- c. environmental acceptability
- d. accord with overall budgetary priorities.

3. TVA has done some pioneering work to improve water quality in its reservoirs and appears to have identified some low-cost techniques. For example, baffles can be installed on turbines for a minimal amount of money and lead to increased oxygen content in downstream releases. EPI would urge the Senate Environment and Public Works Committee to direct all federal water development agencies to take actions to improve water quality in the reservoirs they manage, following some of the TVA lead.

4. As stated in answer #3, EPI thinks that these pioneering TVA efforts should be expanded.

5. EPI believes that TVA should receive federal appropriations for its water quality programs.

6. EPI is not sure what water quality programs of TVA should be classified as national demonstration.

Respectfully submitted,

Brent Blackwelder
Brent Blackwelder
Director of Water Resources

QUESTIONS TO BRENT BLACKWELDER FROM SENATOR BURDICK

- 1) Dr. Blackwelder, do you believe the Tennessee Valley would have been better off if no dams had been constructed there?
- 2) Do you believe there has ever been a case where a dam's benefits outweighed its costs? If so, could you name a few? Do any of TVA's dams fit in this category?
- 3) Are you familiar with the various efforts TVA is making to improve the water quality in their reservoirs?
- 4) What do you think of these efforts?
- 5) Do you believe that TVA ought to continue to receive Federal appropriations for their water quality programs?
- 6) Which of TVA's water quality programs would you classify as "national demonstration" efforts?



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Senate Chamber
State of Tennessee
NASHVILLE

VICE CHAIRMAN
STATE AND LOCAL GOVERNMENT
MEMBER OF COMMITTEES
ENERGY
TRANSPORTATION

July 19, 1985

Senator Gordon J. Humphrey
Chairman, Subcommittee on Regional & Community Development
U.S. Senate
Washington, D.C. 20510

Dear Senator Humphrey,

I want you to know how vital we consider TVA's involvement in our region. We feel very strongly that programs such as the non-power activities of TVA have done much to improve the quality of life for the several states of our region. No one wants any federal agency's activities to go unquestioned, but we feel that the questions should be of a constructive rather than a destructive nature. Quite frankly, there are concerns of past poor management of TVA. However, most of those concerns are related to power production and the decisions relating to nuclear plant construction and not the non-power activities of this agency.

Senator, we in the Tennessee Valley understand the need for budget constraints. We do not feel that the relatively small amount of money will greatly affect the budget deficit which you are facing presently. Yet this relatively small amount means a great deal to our region in the areas of industry and tourism. Please do not throw out the baby with the bathwater. Please do not recommend cuts of a drastic nature which might do great economic harm to our region.

Respectfully,

Jim Lewis
Jim Lewis

REGULATION IS OUR BUSINESS The AGRICULTURE/HOME ECONOMICS/4-H CLUBS/COMMUNITY DEVELOPMENT

Alabama Cooperative Extension Service

STATE HEADQUARTERS
AUBURN UNIVERSITY, AL 36849

June 20, 1985

The Honorable Gordon J. Humphrey
Chairman, Subcommittee on Regional
and Community Development
United States Senate
Washington, D.C. 20510

Dear Senator Humphrey:

I wish to take this opportunity to make available to your committee information regarding the contributions of the Tennessee Valley Authority to the development of Alabama's natural resources, especially in the northern portion of the State.

From the beginning, TVA has been an active participant in a coordinated inter-agency effort which has received national attention. The aim of the thirteen-agency effort is to increase the values derived from the forest resources of the State.

Additionally, the Alabama Cooperative Extension Service has developed cooperative agreements with TVA in the areas of management and timber harvesting. These agreements have led to the development of a statewide system of forest management demonstrations and new timber harvesting technology being transferred more quickly to loggers.

The forest products industry is the number one manufacturing industry in the state, employing one out of every seven persons. It depends on private landowners for about 60% of its raw material needs. But 16 out of 21.3 million acres of Alabama's forestland, owned by 200,000 private owners, are producing only about half of their potential. Intensifying management of these lands is our largest challenge and greatest opportunity; it will raise statewide economic output, increase income to Alabama households, and add more jobs. Equivalent values from soil protection, clean water, outdoor recreation, scenic beauty, wildlife, and hunting will also accrue.

The center-stage issue is how to use the forest resource and subsequently renew it. Both use and renewal are critical. The Tennessee Valley Authority is a valuable partner in the Alabama effort to develop its forest resources for the benefit of its people.

Your consideration of the above statement as a part of your oversight hearings will be appreciated.

Sincerely yours,

Larkin H. Wade

Larkin H. Wade, Head
Extension Natural Resources

/bct

cc: Dr. Ann E. Thompson
Dr. A. Ray Cavender

AUBURN UNIVERSITY, ALABAMA

ALCORN COUNTY HUMAN RESOURCE AGENCY

BOARD OF DIRECTORS
 Alcorn County

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July 17, 1985

E. S. BISHOP, SR.
 Executive Director

Hon. Gordon Humphreys
 Senator, State of New Hampshire
 United States Senate
 Chairman, Committee of Public Works
 Washington, D.C. 20510

Dear Senator Humphreys:

During recent weeks, both our regional and local newspapers have carried news articles on the pros and cons of the proposed reduction in the FY 1986 budget for the support of the Tennessee Valley Authority. After a thorough assessment of the information provided through the newspapers, it seems most illogical that any cuts should be anticipated, surely not implemented in that agency's services to the region of the United States which it now serves.

Probably no agency in the United States has stimulated the economy in as many categories and in as many states in a given region as has TVA through its multiple services. While its distribution of energy for the region has been its major thrust, it has contributed toward the economic development of such states as Tennessee, Georgia, Mississippi, Alabama, Kentucky, and others, its programs of conservation, education, fertilizer, and other categorical programs have been, and continued to be most important to the total economic and social development of both the region and the nation.

Like most Americans, we realize that our national budget, and consequently the deficit, must be reduced. However, a reduction in the services of TVA to achieve the goal would simply magnify the problem through the creation of unemployment and frustration in such cities as Knoxville, Oak Ridge, Chattanooga, Dalton, Gadsden, Athens, the Tri-Cities, Florence, Tusculumbia, and Muscle Shoals, and many other smaller communities in the TVA area. Many of the communities are suffering above average unemployment rates due, primarily, to a severe loss of other federal programs and a diminishing source of local tax revenue. Many of the communities in the Valley are likewise suffering because of the loss of private industries which, at one time, thrived in the region because of healthy government activity and a high level of employment. Currently, this healthy situation is slowly receding due to the mild recession which resulted from the loss of the proposed nuclear plants in the Valley.

Senator Humphreys

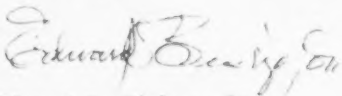
Page 2

July 17, 1985

Please accept this letter which is being hurriedly written without exhaustive research as a fact, and a report on the need for the continuation of services currently being provided through the Tennessee Valley Authority.

We will be most grateful for anything you can possibly do to forestall any cuts in the Tennessee Valley Authority's FY 1986 budget.

Sincerely,



Edward S. Bishop, Sr.
Executive Director

ESB/ajr

ALUMNI AND FRIENDS OF TVA

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Donald Fowler,
Vice President
Louise Waldruff,
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812 Crescent Drive
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July 16, 1985

Senator Gordon J. Humphrey,
Chairman, Subcommittee on Regional and
Community Development
Senate Environment and Public Works Committee
United States Senate
Washington, D. C. 20510

Dear Senator Humphrey:

I am writing this letter on behalf of the Alumni and Friends of TVA (AFTVA). I ask that it be included in the record of your Subcommittee's Tennessee Valley Authority oversight hearings scheduled for July 15, 16 and 30, 1985. AFTVA is an organization of former employees and other friends and supporters of TVA and is supported solely by modest membership dues. As for myself, while I worked for TVA for more than twenty-three years, including twelve years as General Counsel, it is now twenty-eight years since I left TVA employment.

The interest of the members of AFTVA in TVA affairs is based on our respect for the integrity and high quality of TVA management through the years, and our conviction that the TVA program has made a large contribution to the welfare of the nation and will continue to do so if Congress permits.

This letter concentrates on TVA appropriated funds activities inasmuch as your announcement of the hearings indicates that is the emphasis of the hearing. AFTVA supports FY '85 freeze-level minus 10 percent funding for TVA (as the House has approved), and believes that the OMB's proposal for a 70 percent cut in TVA FY '86 appropriations and consequent elimination of its natural resources, regional development and national fertilizer development activities is harmful to the Nation and the Valley region.

Senator Gordon J. Humphrey
July 16, 1985
Page 2

A good illustration of the importance of TVA in American life is its national fertilizer development program, with headquarters in Muscle Shoals, Alabama, which accounts for about a third of a freeze-level budget. It was TVA which first brought to public attention the relationship between the improved fertilizers and the quality of the nation's soils and soil productivity. When I came to TVA in 1933, the farmers in the South bought fertilizer by trade name. "Old Black Joe" was a favorite. Most fertilizers had little soil nutrient content and even less of the minerals essential to the maintenance of soil fertility. It was TVA that first developed highly concentrated fertilizers and used them in a program which emphasized the need for wide choices in types of fertilizers so that farmers could buy and apply fertilizers with the particular balance of ingredients needed for individual farm management plans.

The TVA created a test demonstration program under which farmers throughout the country -- not merely in the Tennessee Valley -- could test, and demonstrate to neighborhood farms, the value of fertilizer materials in overall farm management programs. Many thousands of farms in every state in the country have benefited, and continue to benefit, directly from the TVA Test Demonstration Program, and the influence of these demonstrations has spread efficiency and productivity to many thousands more.

The manufacturing processes and inventions developed by TVA have been available on a non-exclusive license basis, without charge, to all fertilizer producers. Every fertilizer manufacturer in the country has applied for and received licenses from TVA. The influence of TVA's fertilizer research and demonstration programs has been worldwide. It has been a substantial if unquantifiable factor in the agricultural revolution which has increased agricultural productivity in many countries.

These are notable achievements, but the need for the program is far from ended. Depletion of soil nutrients from the farms of this country and from agricultural lands throughout the world is a growing problem with ominous portents. This country should be doing more, not less, to stimulate improvement in agricultural practices, in order to hold the soil on the land and to assure the long term adequacy of the agricultural base on which national prosperity depends. This is not the time to terminate one of the most successful technology transfer efforts in America. OMB's proposal to fund only reduced basic fertilizer research is a mistake. TVA's fertilizer development and technology introduction programs should be fully funded.

Senator Gordon J. Humphrey
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Two fundamental misunderstandings of TVA appear to have misguided those who would dismantle it: that it is simply a regional economic development agency and that it provides unfair benefits to the region. To the contrary, TVA is a national demonstration agency for integrated regional development of natural and human resources, and it provides for the Valley region major non-duplicative services which other agencies provide elsewhere. For example, TVA's hydro-electric system is a model of its kind. It exploits fully all of the inherent values in the streamflow of the Tennessee River and its tributaries which can be economically developed. The system of dams and reservoirs is operated on a multipurpose basis for navigation, flood control and power. The system has also many collateral values; among them, for recreation, industrial development and irrigation. In other parts of the country, these collateral benefits are provided by the Bureau of Reclamation and the Army Corps of Engineers at per capita costs exceeding that requested by TVA for the same purposes. TVA's current national demonstrations include methods for restoring oxygen and other aspects of high water quality to mature reservoirs. As a matter of national policy, the people of the TVA area should not be denied the opportunity to make use of this primary regional resource.

Almost half of TVA's budget (freeze minus 10 percent) is for natural resources management and development. A large portion of this share supports the reservoir system operations and reservoir releases improvements just described. These activities also include weed and mosquito control, management of thousands of miles of shoreline, thousands of acres of reservoir lands and many recreation, historical and archeological sites. Its natural resource responsibilities extend also to integrated management of forest and wildlife populations, and to many environmental education activities.

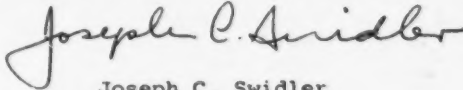
It should have relevance to Congress that the TVA power system is the only federal power system which fully pays its own way. The power system receives no appropriations, but rather is financed by bonds issued by TVA on the credit of the revenues from its power system. Interest and principal are paid solely from power revenues. The interest on the bonds, like the interest on the bonds of private corporations, is subject to federal income taxes. TVA pays the U. S. Treasury currently a return on the total power investment represented by prior appropriations. The amount of the return is not based on the low interest rates at the time (prior to 1959) when the appropriations were made but rather on the current high cost of money to the government. In the last fiscal year the total payment was over \$93 million. Finally, TVA is paying down the appropriation investment at the rate of \$20 million a year. These arrangements were not forced upon TVA but resulted from

Senator Gordon J. Humphrey
July 16, 1985
Page 4

TVA's initiative in establishing a fair business relationship between the TVA power program and the U. S. Treasury. In each of the respects described above, TVA is unique among federal power marketing agencies. The total payments by TVA to the Treasury of over \$113 million approximates the reduced budget request.

I mention the fiscal soundness of the TVA power program in connection with the request for appropriations for non-power activities because it is a key to the high character of TVA administration, and to make the point that the only agency which has not leaned on the Treasury in connection with its power activities is hardly the best candidate for discriminatory cuts in appropriations for the non-power activities which are vital to its ability to perform its mission under the TVA Act.

Sincerely,

A handwritten signature in cursive script, reading "Joseph C. Swidler".

Joseph C. Swidler
President, AFTVA

cc: Senator Pete V. Domenici
Senator John H. Chafee
Senator Frank Lautenberg
Senator Quentin Burdick



American Chemical Society

OFFICE OF THE
PRESIDENT

Elita K. Fields

President-Elect, 1984

President, 1985

Immediate Past President, 1986

1155 SIXTEENTH STREET, N.W.

WASHINGTON, D.C. 20036

Phone (202) 672-4600

July 9, 1985

The Honorable Gordon J. Humphrey, Chairman
Subcommittee on Regional and Community Development
Committee on Environment and Public Works
United States Senate
Washington, D.C. 20510

Dear Senator Humphrey:

The American Chemical Society considers the scientific research programs of the Tennessee Valley Authority (TVA), especially those of TVA's National Fertilizer Development Center (NFDC) in Muscle Shoals, Alabama, to be extremely valuable programs and worthy of continued federal support. As the primary source of new fertilizer technology in the U.S., the NFDC makes significant contributions to the Nation. First, by increasing agricultural efficiency, the NFDC ensures adequate supplies of food at reasonable cost. Second, by substantially increasing the productivity of an industry, the Center aides in reducing the international balance of payments through the export of up to \$40 billion or more of farm products annually.

The NFDC represents a unique government-industry experience. NFDC programs embrace a wide range of chemical, agronomic, and engineering research and development. New, more efficient, and cost-effective fertilizer materials and improved processes for fertilizer manufacture are the end products of this research. The Center also works closely with the private sector to achieve transfer of promising technology to commercial operations. The fertilizer industry readily works with NFDC, testing promising new technology, making additional refinements needed in scale-up to commercial operations, and committing the capital required for implementation. Although the benefits to the American people from a national fertilizer research, testing, and demonstration effort are substantial, these functions are too costly and impractical for individual private firms to undertake alone.

There are many indicators of the importance and value of fertilizer research. For example, it is estimated that forty percent or more of the gain in food production in the past four decades is due to greater use of improved fertilizers. Most of those fertilizers, along with better ways of making them, have come from NFDC.

The NFDC is recognized as the world's leading fertilizer research facility. As a result of its activities, the Center's researchers have obtained about 250 patents. Nonexclusive licences have been granted for the use of these developments in nearly 600 plants in thirty-nine states.

The Honorable Gordon J. Humphrey

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July 9, 1985

Because of the many direct and indirect benefits of NFDC programs, it is difficult to calculate their full value to the U.S. economy. However, a recent NFDC study indicates a return of \$20 for each dollar invested in research. NFDC research has led directly to:

- Manufacture of high-analysis fertilizers that are of superior quality and which each year save farmers more than \$1 billion in freight costs (compared to the cost of transporting and applying low-analysis fertilizers).
- Production of fertilizers in granular, easy-to-use forms instead of dusty, powdery materials.
- Introduction of such fertilizer products as concentrated super-phosphate, ammonium nitrate, high-analysis liquid and suspension fertilizers, diammonium phosphate, urea-ammonium phosphates, and others.
- Manufacture of both fluid and dry fertilizers by more energy-efficient methods.
- Introduction of innovative fertilizer marketing systems.
- Development of technology that conserves the resources used to make fertilizers and also protects the environment.

Research at NFDC also has had many spinoffs. For about ten years, at the request of the Agency for International Development, NFDC supplied fertilizer technical expertise to help developing nations increase their food production capabilities. This activity led to the formation of a separate International Fertilizer Development Center located at Muscle Shoals for easy access to NFDC resources. Basic phosphate chemistry developed at NFDC has found important applications in both the dental and medical fields. Recent work with coal gasification, as an alternative to total reliance on natural gas for ammonia production, also has had a significant impact on the chemical and energy industries.

The importance to the United States of maintaining strong fertilizer research capabilities cannot be overemphasized. Resource and energy situations are continually changing. So are farmers' specific plant nutrient needs. A strong and continuing research effort is required to be responsive to such changes--and to guarantee that the Nation will continue producing food for itself and others. Continued support for the Chemical Facilities and Fertilizer Technology Introduction programs at the NFDC is also imperative since the programs assure that the results of fertilizer research and development will be transferred to the private sector. With no similar broad-based fertilizer effort elsewhere in the United States, or the world for that matter, maintenance of this core research and technology transfer capability is essential.

The Honorable Gordon J. Humphrey

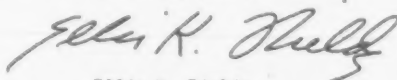
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July 9, 1985

Although our major focus has been on NFDC programs, the ACS also is concerned about continued support for other TVA research programs of national importance. Among these are various environmental and natural resource enhancement efforts, such as biomass research, acid rain studies, air and water quality research, hazardous waste handling, and others. TVA uses its unique research capabilities in these areas to pursue its mission to develop and protect the Valley's natural resources. In so doing, TVA is providing critical leadership, pointing the way for others across the Nation.

The American Chemical Society, a nonprofit scientific and educational organization of more than 135,000 chemist and chemical engineers, strongly urges your continued support of the NFDC and other TVA scientific research programs. The Society acknowledges and is grateful for over fifty years of Congressional support for the programs of TVA and the NFDC. Reduction of this support would do irrevocable damage to some of the Nation's most effective and beneficial research efforts.

Sincerely yours,



Ellis K. Fields



American Consulting Engineers Council

1015 Fifteenth Street, N.W., Washington, D.C. 20005

202-347-7474

Telex: 897445 AMCONENGRC WSH

July 12, 1985

The Honorable Gordon J. Humphrey
Chairman, Subcommittee on Regional
and Community Development
Committee on Environment and Public Works
406 Dirksen Senate Office Building
The United States Senate
Washington, D.C. 20510

Attn: Mark Haynes

Dear Senator Humphrey:

The American Consulting Engineers Council (ACEC), a trade association of more than 4,300 private practice engineering firms employing some 120,000 individuals, is pleased to submit the following comments to the Subcommittee, and asks that this letter be included in the official record of this hearing.

Role of TVA in Economic Development

The Council and its member firms, ninety-five percent of which are small businesses, are certainly cognizant of the role played by the Tennessee Valley Authority (TVA) in the early days of its existence, bringing economic and community development to the seven-state region it serves. Through its flood control and hydroelectric generation programs, TVA dramatically improved the physical and economic health of the area, providing a new standard of opportunity for homes, families, and businesses.

During that period, TVA staff engineers provided technical expertise to design the infrastructure of isolated or impoverished localities. There were few private engineering firms in the area then. Now however, states, local governments and industry are able to draw upon the resources of a host of reputable private firms that are experienced in providing engineering, design, surveying and mapping, special studies and analyses, planning, and other related services.

President: ARNOLD L. WINDMAN, New York, New York. Senior Vice President/Treasurer: LESTER H. SMITH, JR., Nashville, Tennessee. Vice Presidents: EDWARD W. DAVIDSON, JR., Atlanta, Georgia. JAMES E. (BUD) MOULDER, St. Louis, Missouri. ROBERT J. SMITH, Seattle, Washington. ROBERT E. HOGAN, Dallas, Texas. DONALD R. LA ROCHELLE, Lewiston, Maine. LEONARD RICE, Denver, Colorado. President-Elect: LESTER H. POGGEMEYER, Bowling Green, Ohio. Executive Vice President: LARRY N. SPILLER.

The Honorable Gordon J. Humphrey
 July 12, 1985
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TVA as a Competitor to Private Industry

Private firms now find themselves facing two sources of competition, directly and indirectly spawned by early TVA community development programs.

The first type could be called "direct government competition." This occurs when TVA offers assistance to local governments in designing a water treatment facility, a public baseball diamond, or an industrial park. When TVA employees provide such services, they do so at the expense of local firms which provide jobs and build the area's economic base by paying local, state and federal taxes.

A more appropriate role for TVA would be a program of providing, upon request, referrals to sources of qualified engineering firms with experience in solving the particular local design problem at hand.

The second major source of TVA competition, occurs when TVA uses its "excess" design capacity, its in-house engineering staff, to seek or accept projects from other federal agencies. There are two objections to this practice. First, why does "excess" capacity exist? Congress should provide critical scrutiny of existing federal functions and personnel to ascertain that the staff level does not exceed that necessary to maintain technical capability, perform functions inherent in operating and managing federally owned facilities, or truly in the interest of national security. Second, federal policy should encourage agencies requiring technical services to rely on those available in the E/A private sector, not on "excess" personnel in other federal agencies.

Selecting Federal E/A Contractors by Qualifications: In the Client's Interest

When TVA requires performance of architecture, engineering, design, surveying and mapping, and related services, the firm providing those services must, under federal law, be selected on its experience and qualifications. Public Law 92-582 (attached) mandates that agencies follow this selection process. Selection by qualifications rather than price improves the quality of design and can save considerable sums in the cost of construction as well as minimizing change orders, operating costs and retrofitting. Design costs of most federal projects equal only about one-percent of total costs over the life-cycle of the project.

The Engineer as Consultant

TVA contracting with private consulting engineering firms can provide solutions to many problems. Short-term work-load expansion can be accommodated without increasing the permanent in-house staff. Secondly, the occasional requirement for a particular expertise can be satisfied with a minimum commitment of scarce resources. Moreover, many engineering firms are

The Honorable Gordon J. Humphrey
July 12, 1985
Page 3

more likely to apply state-of-the-art solutions and improved productivity with computer-aided analyses and design. Finally, and most important, the consulting engineer leaves the payroll when the project is complete.

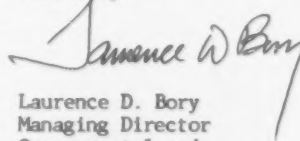
Recommendations

ACEC strongly urges that the Subcommittee examine TVA's program and procedures to determine that:

- o TVA provide local governments and industry in need of engineering services with information on sources of qualified private engineering firms rather than provide these services which are readily available in the private sector;
- o TVA employees neither seek nor accept engineering or other technical services agreements with other federal agencies; and
- o TVA ascertain that when it contracts for engineering and related services with private firms it does so under the procedures outlined in P.L. 92-582.

We appreciate this opportunity to offer our comments on TVA policies and procedures. The Subcommittee should not hesitate to call on us for clarification or expansion of this statement.

Sincerely,



Laurence D. Bory
Managing Director
Governmental and
International Services



1319 Eighteenth Street NW Washington DC 20036 telephone (202) 467-5810

Statement of

R. Neil Sampson
Executive Vice President

to the

Senate Environment and Public Works Committee

Subcommittee on Regional and Community Development

July 30, 1985

The American Forestry Association, the national citizen's organization for trees, forests and forestry, is deeply distressed by the proposed elimination of the natural resource programs of the Tennessee Valley Authority. We thank you for the opportunity to submit a statement for the record in support of the innovative and cooperative research, management, and educational efforts of the TVA.

The TVA has a distinguished history of service to the people and the resources of the Valley, much of which has been due to the effective natural resource, economic and agricultural development programs of the agency. These programs often lead to the development of technologies, natural resource management techniques, and recreational and educational opportunities which benefit the entire country. To suggest that such programs are beyond their usefulness, or that there is no longer any need for them in the Valley, is shortsighted. Many of the resource and economic challenges with which the TVA has wrestled are now facing other regions of the country; TVA's cooperative, yet non-duplicative, interactive relationship with other federal and state agencies is a useful model for the nation.

We would like to highlight examples of TVA's contributions to the environment and natural resources of the region, and the nation as well. For convenience, we will group these efforts and accomplishments into the following general resource categories: forestry and agriculture; water; wildlife; and environmental education and research, although specific programs obviously benefit many if not all of these broad areas. In addition, we would like to address the importance of Land Between the Lakes, the national recreation and environmental education center which benefits over two million visitors annually, and which in many ways exemplifies the broad accomplishments of the agency.

Forestry and Agriculture. The science and practice of forestry has benefitted greatly, as has the region's economy, from TVA's reforestation and

forest management research and leadership. Millions of trees were planted because of TVA education and outreach to private landowners. Those trees are now a major factor in the economy of the Valley. Today, the country as a whole faces the challenge of too many acres of marginal acres in crops. Currently, TVA, USDA, State, universities, and other organizations conduct cooperative soil and water conservation programs in the region. TVA's continued leadership, outreach and program support in conservation is needed in the coming years to address this crucial resource problem.

Water. TVA's effort to provide a surface water quality monitoring and trends assessment--to help TVA manage its reservoirs-- provides information for State discharge permits, and acts as an early warning system for emerging water quality problems. TVA cooperates with States, and federal agencies such as the Soil Conservation Service, and the Environmental Protection Agency to address non-point source pollution and toxic water contamination from surface mining, agriculture, livestock operations and other sources.

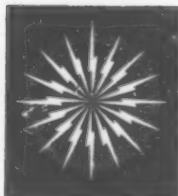
Research. TVA is taking significant steps to develop and implement pollution control technologies for its power plants, concepts which are appropriate for other power generators as well. TVA is also conducting important studies on the effects of air quality--specifically acid precipitation-- on soils, forests, fisheries, and water quality. If allowed to do so, TVA will no doubt continue to be an important cooperator in the effort to understand the causes and impacts of acid precipitation.

Environmental Education. In addition to the educational activities that it operates on its own lands, TVA has established a network of 11 cooperative centers at Valley universities that provide teacher training, educational programs, research, and environmental study areas. This model for environmental education is now spreading to universities outside the Valley, and States as far away as North Dakota and Montana are working to establish similar programs.

The Land Between The Lakes. Land Between The Lakes provides a national demonstration in integrated natural resource management, providing wildlife, recreation, and education benefits. It receives visits from over two million people a year who come to hunt, fish, camp, observe wildlife, or just to "get away". These visitors leave with a renewed understanding and appreciation of their natural environment. Land Between The Lakes is a fitting symbol of the multipurpose, imaginative approach which is characteristic of the agency today.

The history of TVA is a proud one, and its work and future contributions are far from complete. Per capita income of this region still lags behind the national average, and national investments, in the development and improved utilization of the region's resources, through a proven performer like TVA, are an important key to helping the region close the gap. Furthermore, TVA provides information and models of cooperation which can help combat resource problems at the national level.

We hope, as the Congress develops the 1986 budget, they will take the value of this organization, both to the region and to the Nation, into consideration.



AMERICAN PUBLIC POWER ASSOCIATION

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Burlington, Vermont

August 2, 1985

Honorable Gordon J. Humphrey, Chairman
Subcommittee on Regional
and Community Development
Committee on Environment
and Public Works
410 Dirksen Senate Office Building
Washington, D.C. 20510

Re: TVA Oversight Hearings

Dear Senator Humphrey:

The American Public Power Association, the national service organization representing over 1,750 local public power systems throughout the country, is very interested in your subcommittee's oversight hearings on the power and non-power programs of the Tennessee Valley Authority. APPA was anxious to participate in these hearings to testify on the regional and national benefits provided by TVA. However, we appreciate the fact that time constraints made it impossible to schedule presentations by all interested witnesses. We do request that this letter be included in your TVA oversight hearing record.

The Tennessee Valley Authority was conceived as a great social experiment. Over the past half-century, that experiment has worked extremely well. TVA has developed the natural resources within the region, capitalizing on the energy potential of the great Tennessee River and its tributaries to provide reliable and relatively low cost power to municipal and cooperative distribution systems. As the potential to develop additional hydropower diminished, TVA was forced to turn to thermal resources in order to meet the growing power needs of its wholesale customers. Today, TVA operates the largest electric utility system in the country.

By its charter, TVA is, however, much more than just an electric utility. It operates under a broad mandate to carry out activities or programs in such areas as economic and community development, agricultural and fertilizer development, natural resources conservation and development, soil conservation, water resources management and related research and development projects. The regional, national and international benefits of these activities were well documented by the witnesses who appeared before your subcommittee.

APPA was alarmed to discover earlier this year that the Administration had proposed to slash TVA's non-power appropriated funds budget by 71 percent, from a requested \$135 million to \$38.6 million. Cuts of this magnitude would eliminate numerous non-power programs which are important to the nation as well as the Tennessee Valley region. The Association formally expressed its opposition to the budget cuts by adopting a resolution at its annual conference in May of this year which urged that sufficient funds be provided to permit TVA to fulfill its legislative mandate in non-power areas. A copy of that resolution is attached.

While the Subcommittee's hearings were presumably designed to examine TVA's non-power program, there was considerable discussion of the power program as well. Much of this discussion concentrated on whether there is a federal subsidy involved in this program. Because TVA is a federal corporation, because appropriated funds were initially provided to construct many of TVA's hydropower and thermal facilities, and because TVA's power rates are below the national average, many people jump to the conclusion that the TVA electric ratepayers must be the beneficiaries of a federal subsidy. That is not the case. TVA's power program is entirely underwritten by the Valley ratepayers.

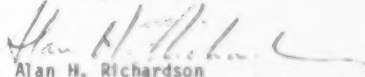
By definition, a subsidy is a grant or a gift. There have been no grants or gifts to TVA from the U.S. Treasury. In fact, the reverse is true. In 1959, TVA was authorized by Congress to borrow funds from private sources for future power development. At that point, there was a federal investment in TVA's power facilities of \$1.4 billion. TVA was under a legal obligation to repay this investment; however, the self-financing act expanded this obligation. Specifically, TVA was required to make an annual repayment of prior federal investments together with a return on this investment. This return is computed annually and is based on the current cost of money to the U.S. Treasury. As of the end of 1984, TVA had paid approximately \$1.9 billion into the U.S. Treasury. Last year alone, TVA repaid \$20 million of the outstanding federal investment, and more than \$93 million as a return on the investment. Thus, if anything, the federal government is making money from TVA power sales.

In addition to being totally self supporting, the TVA power program is committed to providing the low-cost power to the Valley ratepayers in the most environmentally sound manner. In so doing, TVA has served as a model for other utilities around the country, and its research has provided significant national benefits. During the subcommittee's hearing on July 16, Senator Gore noted how TVA's activities in the area of energy conservation provided considerable assistance to Congress as we as a nation struggled with the energy crisis of the late 1970's. The subcommittee also heard testimony on TVA's activities in electric vehicle research, the clean burning of high sulfur coal through the atmospheric fluidized bed combustion process, and its concerns and recommendations for dealing with acid rain. These activities and others described during the hearings clearly demonstrate the benefits which have been provided by TVA to the Valley and to the nation.

While TVA has been responsible for many worthwhile programs and has many accomplishments of which it can be justifiably proud, it has, like every institution whether public or private, made mistakes. However, we do not believe that these mistakes make the case for any structural changes in the Authority. TVA has been responsive to legitimate criticisms in the past. We feel confident it will continue to be responsive in the future. However, the only guarantee that this will be the case is to ensure that TVA's directors are men or women who have experience, integrity and good judgment. TVA Board appointments should not be political favors. They must be based on merit. If this continues to be the guiding principle we are confident that TVA's second fifty years will be as successful and rewarding as its first fifty.

Mr. Chairman, APPA appreciates the fact that you have permitted TVA and others to both praise and criticize TVA. We believe the record established in these hearings demonstrate how valuable TVA's power and non-power programs have been and provides justification for their continuation in the future.

Sincerely,


Alan H. Richardson
Assistant Executive Director

AHR/skp

enclosure

TVA's NON-POWER PROGRAM

WHEREAS, economic and community development, agricultural and fertilizer development, natural resources conservation and development, soil conservation, water resources management and related research and development are, together with power production, flood control and navigation, part of the very foundation of the Tennessee Valley Authority Act of 1933, and

WHEREAS, TVA's non-power program provides significant national benefits, such as the development and commercialization of improved fertilizer products which have directly contributed to this country's low-cost and secure agricultural abundance, and

WHEREAS, TVA's role as an economic and agricultural development agency is highly respected throughout the country and has been studied and emulated in other countries throughout the world, and

WHEREAS, the ability of TVA to continue to undertake worthwhile non-power related economic, agricultural and environmental development programs would be diminished if not eliminated under the Administration's fiscal year 1986 budget under which non-power appropriations would be cut from their current level of \$135 million to \$38.6 million, a reduction of 71 percent, and

WHEREAS, cuts of this magnitude would turn TVA into a utility rather than an agency concerned with both power and non-power development needs of the Tennessee Valley region;

NOW, THEREFORE, BE IT RESOLVED: that the American Public Power Association supports TVA's economic, agricultural and environmental development programs and urges the Congress to reject the Administration's proposed budget for these programs and instead provide sufficient funds to enable TVA to continue to fulfill its legislative mandate in non-power related areas.

-- Adopted by the membership of the American Public Power Association at its annual conference in Los Angeles, California, May 7, 1985.

Testimony of
 Winifred A. Pizzano
 Federal Co-Chairman
 Appalachian Regional Commission
 before
 The Subcommittee on Regional and Community Development
 Senate Environment and Public Works Committee
 July 16, 1985

I appreciate this opportunity to submit for the record of these proceedings before the Subcommittee on Regional and Community Development the following observations regarding changing opportunities for federal support of targeted economic assistance.

I commend the Chairman, Senator Humphrey, and the other members of the Subcommittee for their interest in this timely and important subject.

The issue of economic development has never been more important. Today's rapid rate of change in both world and national economies has created pressures and strains on local economies not heretofore seen on such a wide scale. Many of our large, traditional industries are undergoing structural changes and world trade has increased with corresponding effects on our economy and labor force.

Moreover, this discussion of economic development is particularly timely given the growing willingness — spurred by widespread concern about deficits — to reconsider the most effective roles of federal, state and local governments in encouraging economic growth.

For the most part, the federal role in economic development has emphasized subsidies of public works and other infrastructure investments.

Encouraged by federal policies and funds, state and local industrial development programs have been designed to offer sizable locational subsidies to lure manufacturing firms away from other states and regions. Over time, it has become clear that this strategy of "smokestack chasing" has benefitted some communities, but harmed others — while doing little to expand the overall output of the national economy, and costing the U.S. Treasury billions of dollars in direct expenditures and foregone tax revenue.

A growing number of governors and economists believe that these locational grants and subsidies are often ineffective tools for economic development and from a national perspective do not increase wealth.

First, they focus on large manufacturing firms while the majority of new jobs are being created by small firms and the service industries.

This is not only a well-documented trend nationally but one we have experienced in Appalachia as well. From 1980 to 1983, for example, manufacturing led a regionwide pattern of net job losses in all sectors — except the service industries, which gained jobs during this period.

That is, no doubt, one reason many economists are now urging state and local governments to worry less about stemming job losses, and more about encouraging the creation of new businesses — the source of at least half the new jobs created each year in our economy.

Second, almost all state and local governments now offer attractive packages of locational subsidies, thereby nullifying any differential advantage over other states and localities that the various locational subsidies might otherwise have created.

In addition, most state and local development offices have found that they lack the necessary market information for picking a winning industrial structure — that is, for knowing which industries to attract.

In another vein, federal attempts to overcome regional poverty and distress by creating new regional agencies, such as the Economic Development Administration (EDA) have met with only limited success.

EDA began as a well-intentioned program designed to provide federal development aid to areas of clearcut economic distress. Over time, however, political pressures have led to the diffusion — and thus, the dilution — of supposedly targeted assistance to neighboring, non-distressed areas. In my view, when fully 80 percent of the nation's counties qualify for assistance under EDA's funding criteria, the program can no longer be defended as one providing targeted aid to distressed areas.

Or, consider the case of ARC, created in 1965 in order to help an historically distressed region pull itself onto an economic and social par with the rest of the nation. A worthy objective at the time, but ARC is today spending federal tax dollars to aid many communities far better off than others outside the legislatively-defined boundaries of the Appalachian region — communities ineligible to apply for federal funds in their area from any similar program.

Simply tightening eligibility criteria — while a welcome step in the right direction — would not, in and of itself, enable federal officials to make the best possible use of the roughly \$350 million now being spent each year on these two programs.

Rather, the issue in federal aid for economic development is two-fold: what level of federal funding is appropriate; and how can federal development programs best be restructured to address the current trends and realities in the creation of wealth and jobs?

Marginal efforts at reform in the many other federal development programs and subsidies will not insure the most cost-effective expenditure of the more than \$5 billion now being spent by Washington each year on targeted economic assistance.

Instead, more sweeping and fundamental changes must be made in the entire federal approach to economic development. The hearings being conducted by this Subcommittee provide an excellent opportunity to add to our understanding of what works and why — as well as what doesn't work, and why — in this enormously complex and controversial area of public policy.

Underlying — and in essence prompting — the need for new ways of encouraging economic development in this country are sweeping changes in world market forces, as well as quantum leaps in the rate of technological change. Both developments have had a profound impact on the ability of communities everywhere to create new jobs and retain the ones they already have.

A balanced approach to economic assistance, targeted or not, therefore, should include what we know about the most likely sources of new jobs in the future — and also the most promising efforts to create them now being pioneered by several states across the country.

Just as important, a forward-looking federal approach to targeted economic assistance should reflect one of the pre-eminent fiscal realities of the 80's and 90's: namely, that there is unlikely to be any significant increase, in real terms, in the level of federal funding currently available to support federal economic development activities.

After all, more than \$5 billion is now being spent each year to support sub-federal economic development through such programs as Community Development Block Grants (CDBG), Farmers Home Administration (FmHA), Urban Development Action Grants (UDAG), the Economic Development Administration (EDA), the Appalachian Regional Commission (ARC), and the Tennessee Valley Authority (TVA). This figure includes neither additional lost revenue of \$5 billion through Industrial Revenue Bonds, nor additional expenditures for job training.

Re-directing some share of those funds to new activities, while targeting more tightly to distressed areas the funds still being spent on traditional infrastructure projects, could increase significantly the marginal return on a fixed — or even reduced — level of federal economic development funding.

I would like to suggest to the distinguished members of this Subcommittee that any new comprehensive federal policy on economic development be fashioned around the following four propositions.

First, the federal role in state and local economic development should be above all, non-interventionist. Economic problems, possibilities, resources, and realities vary greatly from state to state, as well as from region to region. State economies are best understood by state officials. Accordingly, individual states should make most key decisions regarding economic development efforts within their borders.

Without question, the federal government can do — and has always done — much to influence economic growth or decline at the state level. Federal fiscal, monetary, trade, regulatory, and even defense spending policies inevitably affect — for good or ill — economic development at the state and local level. That reality will not change.

But from a programmatic standpoint, I think the lesson of the last twenty years is that the less interventionist the federal role in economic development, the better.

Second, the development of America's human capital — our workers — should command an increased share of our development dollars in the years ahead.

People are our economy's most mobile, flexible, and long-lived economic resource. They are without question the biggest unknown in the equation for our future economic growth. Will we continue to tolerate a high school dropout rate that — even after a quarter century of attention — remains relatively unchanged, hovering around 25 percent nationally?

Similarly, will we — as a nation — declare all out war on the shameful problem of adult literacy? Surely, America's economic future is no less threatened by that growing threat from within than by any number of well-publicized challenges from overseas.

Finally, will we begin to take the steps necessary to develop vocational and technical programs that provide real training for real jobs. Several states — South Carolina, in the Appalachian region, for example — have pioneered very successful programs that are "employer-driven", training students for jobs that employers have given assurance will be there when the training is complete.

Another proposal for improved vocational training that merits careful consideration is performance-rated, accountability funding. Proponents of this approach argue that not enough attention has been paid in the past to the rate at which students completing particular vocational programs find jobs related to their training.

The bottom line is that the economy of the future will demand a better educated and trained workforce than our current system — with the problems of dropouts, illiteracy, and obsolete voc-ed programs — can provide. Thus, the success of any forward-looking federal economic development policy will be closely tied to the success of our efforts to improve the development of America's human capital.

Third, the evolving federal approach to economic development — while infused with a variety of new approaches responsive to new realities — should be balanced by a continuing commitment to support a prudent level of traditional, job-creating infrastructure projects.

Since the earliest days of commerce, economic activity has occurred in places with access to transportation. Rivers, harbors, roads and rail lines have all played major roles in the development of local and state economies.

Even in this age of lasers, computers, microwave communications and fiber optics, the importance of transportation to economic development may change, but it will never end. There are other types of infrastructure — sewer and water systems, for instance — that have a proven role in economic development, when properly planned, paid for, and constructed. Accordingly, some degree of support for such projects should remain an element of our evolving economic development strategy.

Fourth, and perhaps most important among the propositions on my list, the primary goal of future federal economic development efforts should be to help create an environment more conducive to entrepreneurial activity.

The states — quite a few of them in any case — are ahead of the federal government in this area. They have recognized the potential returns from moving to create a favorable "entrepreneurial environment", and have been leading the way on a number of fronts.

It is widely agreed that the lion's share of all new jobs in this country are created by small business. And yet, knowing that, we nevertheless have done little in recent years to remove the countless obstacles to small business success erected by governments at every level — federal, state, and local.

Far and away the most formidable barrier to new and growing businesses — whether high tech or low tech, product or service oriented — is access to capital.

For some firms, the greatest need is for "risk" or "venture" capital — to help a new and initially successful firm move up to the next level of economic activity.

For fledgling firms, on the other hand, the much more modest need may be for "seed" capital — typically in lesser amounts than venture capital, but rarely lesser in importance to the survival and growth of the firm.

Existing restrictions — both direct and consequential — on the flow of much-needed capital to the very types of firms on which so much of our economic future depends are legion. Rather than enumerate them in this brief statement, let me simply underscore my belief that those shaping future federal development policy can undertake no more fruitful activity than a comprehensive review of all possible actions the federal government might take to increase the availability of capital for the firms most likely to spur economic growth and create jobs.

Making matters worse for entrepreneurs in our economy is the intimidating array of barriers erected by all manners of regulatory agencies at every level of government. Here too, the federal government has an opportunity to improve the entrepreneurial environment by seriously, albeit sensibly, relaxing regulatory barriers to economic activity.

Nevertheless, a concerted federal effort to achieve regulatory reform, if successful, would pay sizeable dividends — in jobs, income, output, and resulting tax revenue — for years to come.

The federal government can also help programmatically to improve the entrepreneurial environment by supporting efforts to provide assistance — technical, advisory, financial, and otherwise — to entrepreneurs lacking those resources typically taken for granted by larger, more established firms.

Though by no means alone in this area, Pennsylvania has established an enviable track record in recent years with programs specifically designed to create an environment in which entrepreneurs can survive and grow.

Governor Dick Thornburgh's Enterprise Development Program has proven to be a very successful mechanism for providing different forms of assistance to small businesses, and is being replicated by other states. Operated by Pennsylvania's local development districts, the Enterprise Development Program uses a "one stop shopping" approach to offer management advice, loan packaging, financial projections and accounting models to small entrepreneurs to whom such services might otherwise be unavailable, or unaffordable.

Small business incubators are another innovative way of assisting entrepreneurs — permitting a number of firms to share space and overhead in a larger facility for a specified period of time. Once on their feet, such firms move out of the incubators to other locations, making their space in the shared facilities available for another round of fledgling firms. Incubators are an integral part of Pennsylvania's program, and are also being supported in quite a few other states.

In order to help firms turn the potential of high tech into the reality of new jobs, Pennsylvania created the Ben Franklin Partnership program — a truly innovative approach, linking the state government, several universities, and private sector entrepreneurs in an effort to create new jobs from emerging technologies. This program makes available financial and research assistance to firms and individuals with innovative ideas and processes that require further development to become commercially viable. In the Appalachian region alone, there are similar technology transfer programs underway at Mississippi State and Oak Ridge, Tennessee.

In these times of high deficits and tight budgets, few programs make more sense when assisting small businesses than revolving loan funds; and few states have used revolving loan funds more effectively than Pennsylvania, where they are matching, leveraging, and in other ways stretching scarce loan dollars creatively to reach as many entrepreneurs as possible.

There, outlined very briefly, Mr. Chairman, are four propositions which I respectfully suggest should be central to a new federal policy for supporting state and local economic development efforts:

- 1) A non-interventionist posture by the federal government — permitting the states themselves to set their own development priorities;
- 2) A redoubled commitment to developing America's human capital — focusing on dropouts, adult literacy, and improved vocational/technical training; and,
- 3) A balanced approach to federal funding — which includes both new and innovative strategies as well as a prudent level of support for cost-effective infrastructure projects;
- 4) The establishment as the ultimate goal of federal development policy the creation of an entrepreneurial environment — one as favorable as possible to the growth and development of the firms on which this country's economic future most depends.

Not everyone agrees on the most appropriate means by which the federal government should support sub-federal economic development.

On the other hand, everyone would agree, it seems to me, that not all the federal development programs now in place have been equally successful or effective.

Such agreement, however, is only the first step toward eliminating — or scaling back — less successful programs in order to make possible other, more promising efforts.

But, we must look across many federal programs to restructure our approach. Simply eliminating programs would make only a very small dent in the problem. Educational and vocational education funds, job training programs, infrastructure programs and the plethora of small assistance programs must be examined for regulatory barriers, disincentives to move with the economic trends and over-dependence on federal funding.

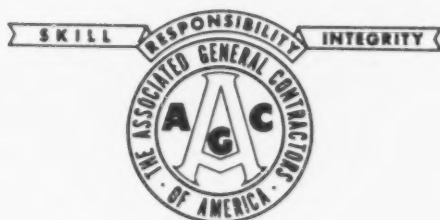
Now, the hard work is beginning — made possible, in perhaps equal parts, by growing public concern about the potentially ominous economic effects of rising deficits, stiffer foreign competition, and changing technologies.

This opportunity to re-think in a comprehensive fashion the entire range of federal economic development programs has been long in coming — but will likely be short in duration. As federal policymakers, we must move responsibly but rapidly; for opportunities slowly seized are quickly lost.

I believe the Subcommittee on Regional and Community Development has made — and will continue to make — a valuable contribution to the all-important task of shaping a forward-looking federal development policy which can serve America well not only for the rest of the 80's, but for many years to come.

Once again, I commend Chairman Humphrey and his colleagues for conducting these important hearings, and I appreciate the opportunity to participate in them.

Statement of
The Associated General Contractors of America
Presented to the
Subcommittee on Regional and Community Development
of the
Committee on Environment and Public Works
United States Senate
July 22, 1985
On the Topic of
Oversight of the Tennessee Valley Authority



AGC is:

- * More than 30,000 firms including 8,400 of America's leading general contracting firms responsible for the employment of 3,500,000-plus employees;
- * 110 chapters nationwide;

AGC members complete:

- * More than 80% of America's contract construction of commercial buildings, highways, industrial and municipal-utility facilities;
- * Approximately 50% of the contract construction by American firms in more than 100 countries abroad.

The Associated General Contractors of America (AGC) represents more than 30,000 firms including 8,400 of America's leading general contracting companies which are responsible for the employment of more than 3,500,000 employees. These member contractors perform more than 80% of America's contract construction of commercial buildings, highways, industrial and municipal-utility facilities. The Associated General Contractors of America is most pleased to present its views on TVA's construction operations.

It is our understanding that TVA is making an effort to reevaluate its operations, including its construction programs, in order to reduce its costs. We are encouraged by TVA's decision to move forward in their reevaluation and urge them to do so as soon as possible. It is the intent of our comments to suggest improvements that can be made by TVA in its construction program. These improvements can result in cost reductions and ultimately lower electric service bills for TVA's customers.

Contract Construction

For years AGC has been in disagreement with certain aspects of TVA's construction programs. We are certain that private enterprise is the most cost effective type of construction. AGC has consistently called for reexamination by TVA of its practice of using its own forces to build construction projects.

AGC believes that the federal government's usual and traditional preference for competitively bid construction contracts is far superior to the approach which has been adopted by TVA. As early as 1809, Congress required that "All purchases and contracts for supplies or services...shall be made either by open purchase or by previously advertising for proposals." This preference for the competitive bid contract system results in the lowest cost to the owner and best protection for the public in the expenditure of tax dollars.

Advantages of Contract Construction

The contract method of construction has numerous advantages, for example:

- The public only pays for what it receives with work actually performed as the basis of payment.
- The price is firm and guaranteed by the contract, and the public has no risk of cost increases. All of the variables of the marketplace, such as increases in material prices, wages and shortages are borne by the private contractor.
- Timely completion is assured by a liquidated damage provision.
- Faithful performance is backed by performance and payment bonds.
- Risk of damage during construction is borne by the contractor, not the public.
- The contractor must "defend and hold harmless" the public against claims and must provide the public with insurance coverage.
- Quality inspection is at "arm's length" by independent inspectors.
- The final work is warranted and defects must be corrected at no expense to the public.
- The general contractor provides centralized responsibility for the project.

The cost effectiveness of the contract method is demonstrated by the annual volume of federal government construction work performed on a contract basis. Despite demonstrated advantages of private contract construction, the majority of TVA construction has been performed by its own forces.

Contracting Out Versus "In-House" Construction

AGC believes that the magnitude of prospective savings in TVA's outlays for construction warrants a careful study of the comparative costs of TVA force account construction versus private competitively bid construction by contract. Such a detailed cost comparison for all of TVA's construction programs has never been undertaken. In 1971, however, a TVA task force of three consultants and two former TVA officials studied various aspects of TVA's Office of Engineering Design and Construction operations. One area reviewed was force account versus contract

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construction. The task force concluded that TVA had not developed detailed comparisons to support its claim that construction by force account was competitive with private industry.

Circular A-76 and TVA

Office of Management and Budget Circular A-76 requires cost comparisons prior to the federal government initiating a commercial activity for the procurement of needed goods and services. After receiving the A-76 Circular in 1967, the Tennessee Valley Authority defined its entire construction program as an "existing government activity," and waived the requirement for further review. As a result, TVA continued its practice of in-house construction.

More recently, and with the need everywhere to significantly reduce costs, TVA has begun a reevaluation of its policy of using only TVA employees and construction equipment. In a recent statement TVA's manager of the Office of Power and Engineering (Nuclear) stated that TVA will have to competitively bid for engineering and construction work.

AGC encourages TVA to continue to pursue its reevaluation which was begun, in part, because of TVA's inability to attribute cost overruns to any single source within TVA. This lack of a single source of accountability has cost the TVA's ratepayers millions of dollars. Based on decades of experience with the competitively bid single contract method of construction, problems of single source of accountability can be overcome.

Recommendations

AGC recommends that TVA adopt a blanket policy of contracting out all of TVA's construction which in turn will result in considerable savings for TVA and its ratepayers as well as providing economic opportunities to the construction companies and their employees in TVA's region.

AGC also recommends that TVA be required to utilize the cost comparison procedures of the Office of Management and Budget's Circular A-76.



ASSOCIATION OF STATE FLOODPLAIN MANAGERS, INC.

TESTIMONY PRESENTED TO
THE
SENATE REGIONAL AND COMMUNITY DEVELOPMENT SUBCOMMITTEE
OF THE
SENATE PUBLIC WORKS AND ENVIRONMENT COMMITTEE
ON THE
TENNESSEE VALLEY AUTHORITY

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By

The Association of State Floodplain Managers

P.O. Box 2051

Madison, WI 53701

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July, 1985

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INTRODUCTION

The Association appreciates the opportunity to present written testimony in support of the scope, purpose and direction of TVA's programs and activities. We will focus on TVA's floodplain management programs.

The Association of State Floodplain Managers represents professionals in flood hazard reduction in all 50 states. The goal of the Association is to promote effective floodplain management through cooperation between agencies and all levels of government. Cooperation for the exchange of technical information, management techniques and program progress is critical to sound floodplain management. In turn, sound floodplain management saves lives, protects property and reduces federal expenditures for disaster relief and flood insurance claims.

TVA'S ROLE IN REDUCING FLOOD LOSSES

When TVA initiated its floodplain management assistance program in 1953, it envisioned that the loss of lives and property in floods could be substantially reduced over time through local governments controlling land use in the floodplain.

Today, we view this approach as commonplace, but it was a forerunner in 1953. Not until nearly 20 years later did the rest of the nation start to follow suit in this approach toward reducing flood damages and protecting life, health and property from flooding.

During that 20 years, TVA developed many of the basic approaches used today in planning and implementing local flood hazard management programs. TVA programs serve as a model for many of the counties, cities and villages in the nation and for many of the states in adopting comprehensive floodplain management programs. The heart of this approach is that floodplain management, to be truly effective, must occur at the community level. However, most communities, especially the vast majority of communities which are small in size, have neither the technical expertise nor professional staff to undertake the engineering, planning and other processes necessary to put in place a comprehensive program. The TVA idea was to create an assistance agency that would provide the engineering data and other technical expertise to identify flood hazard areas, provide the professional staff assistance to help communities develop plans to fit their needs, and to work with the communities in implementing and administering such regulations. In this way, future flood losses could be reduced and the threat to life, health and property could be minimized at a reasonable cost to the public.

Today, nearly 35 states have laws requiring flood hazard regulations at the local or state level. In addition, the National Flood Insurance Program requires local land use regulations to protect future development from flood hazards in exchange for subsidized flood insurance for existing structures. These programs epitomize the approach developed by TVA and transferred throughout the rest of the nation.

THE TVA FLOODPLAIN MANAGEMENT PROGRAM - UNIQUE AMONG THE AGENCIES

The Association firmly believes that the TVA floodplain management program does not duplicate other federal programs, but complements them and acts as a mechanism to coordinate flood damage reduction programs between agencies and different levels of governments. The National Flood Insurance Program (NFIP), administered by the Federal Emergency Management Agency (FEMA), is regulatory. It requires that local communities regulate new development in flood hazard areas so that it will be protected during flooding. In exchange for that local regulation, flood insurance at affordable rates is made available to local citizens for the existing structures in flood hazard areas. This program is an important element in an overall floodplain management program at the local and state level. We view the TVA program as one of assisting states and local communities to properly meet their commitments under the National Flood Insurance Program. In other words, it is one of providing technical assistance and engineering expertise to those communities which do not otherwise have such expertise.

Flood insurance and the regulations required under that program are merely one element of a comprehensive floodplain management program. A comprehensive program includes many aspects of preparedness, response, recovery and mitigation. Regulations are a nonstructural approach toward guiding new development. The National Flood Insurance Program, however, does nothing to deal with the reduction of flood damages to already existing structures in flood hazard areas.

While the Corps of Engineers has been active in this area, its structural approach toward flood damage reduction has resulted in very few projects over the past 15 years. TVA works closely with states and communities in its region to address the reduction of flood damages to existing structures. We believe that is an essential and necessary program. Unfortunately, on a national scale in areas other than the Tennessee Valley, there are very few agencies or programs available to provide the technical assistance to help states and communities reduce flood damages to existing structures. The Soil Conservation Service deals with soil erosion and upstream flooding with a focus on rural America.

The TVA approach uses the broad, comprehensive effort aimed at solving the flooding problem where it occurs at the citizen and community level. Many of the engineering methods for defining flood hazard areas, computing hydrology and hydraulics and other techniques were developed and refined by TVA in conjunction with other agencies. As mentioned, many small communities do not have the technical expertise, especially the engineering capability, to undertake these planning and implementation programs. Fortunately, TVA has been able to provide that assistance on a regional basis.

TVA'S INFLUENCE BEYOND THE TENNESSEE VALLEY

TVA's influence on floodplain management extends far beyond the reach of the Valley. Today, most of our member states use the basic technical assistance approach to floodplain management in their states that was developed by TVA. We continue to focus on assisting local communities to reduce flood damages by a bottom-up approach. We use "TVA tested" engineering techniques and

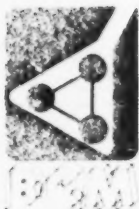
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technical assistance concepts. TVA has not only provided a yardstick, but continues to set an example of what can and can't be done. Today, after 15 years of floodplain management in many of our states and local communities, we are at a point in our programs where we need to evaluate how effective our current approach is and whether some techniques and approaches work better with different types of communities. Communities with ample nonfloodplain development sites are in need of a different approach for reducing and preventing flood damages than those communities who have no alternative sites available. Are different communities and different types of river systems in need of different types of assistance? TVA is currently leading efforts to help us evaluate the effectiveness of current programs and how we may be more effective in providing assistance and in delivering programs for flood damage reduction to communities. The information and techniques will be transferable throughout the nation. We in other states and other communities in the nation are looking forward to this information for our use.

The TVA region has a particular problem of rough or mountainous terrain with a shortage of flood free sites for future development. This situation needs the special and extraordinary efforts of TVA if flood damage reduction and economic growth are to be balanced.

The Association of State Floodplain Managers strongly supports TVA's floodplain management programs as a leader in the field. Their current efforts to guide future flood damage reduction programs are critical to the development of policies and programs that will effectively reduce taxpayer costs and prevent the loss of life, health and property from flooding. We believe the investment in TVA programs pays good dividends. We look forward to a continued cooperative effort with TVA.

5473J



June 19, 1985

Robert B. Johnson
President

Senator Gordon J. Humphrey
Committee on Environment and Public Works
Subcommittee on Regional and Community Development
U.S. Senate
410 Dirksen Building
Washington, D.C. 20512

Dear Senator Humphrey:

I am writing in support of the Tennessee Valley Authority and respectfully request that you include my letter in the proceedings of the oversight hearings on TVA July 15-16 and 22, 1985.

BCM, Inc., was founded in 1974 and distributes more than 600,000 tons of fertilizer in 35 states. Most of this fertilizer is based on technology developed by TVA's National Fertilizer Development Center in Muscle Shoals, Alabama. TVA has more than 250 patents for fertilizer production processes, and technology developed by TVA is used in producing three-fourths of the 50 million tons of fertilizer used annually by the American farmer. Fertilizer is tremendously important to the productivity of United States agriculture which is the envy of the world. I am sure that you are aware that we in the U.S. spend a lower percentage of disposable income on food than citizens of any other country.

TVA fertilizer research and development has kept the U.S. fertilizer industry a step ahead of our foreign competitors. To illustrate, U.S. phosphate producers exported about 9 million tons of fertilizers last year and 1985 exports will exceed 10 million tons. Diammonium phosphate is the principal fertilizer exported; this material and other high analysis phosphates are being produced by TVA processes. The fertilizer industry, like the automobile industry or textile industry, is global in nature and we must stay out front technologically if we are to survive. We have ample

BCM, Inc. *Suppliers of Basic Materials and Chemicals for Agriculture and Industry*

Member: The Tennessee Institute

P O Box 17866 / Memphis, Tennessee 38187-0866 / 901-767-8706 / Telex 810-591-1297 / Cable BCMCO

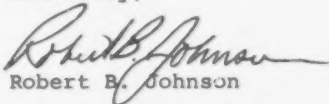
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Senator Gordon J. Humphrey

supplies of phosphate rock, but the quality of this ore is declining. New processes must be developed to use this lower grade ore. TVA is the only organization which has the expertise to develop the new technology the U.S. industry must have to remain competitive.

I consider TVA's work in fertilizer research and development to be critical to the future of the U.S. fertilizer industry, to the American farmer, and to the consumer who desires a bountiful supply of low-cost food. I urge you and other members of the Senate to provide adequate funding to TVA for conducting this essential work.

Sincerely,



Robert B. Johnson

RBJ/bws

Beker Industries Corp.

Box 37, Conda, Idaho 83230

Telephone: 208/547-4381, TWX 910-978-5768

June 24, 1985

Senator James A. McClure
Chairman of the Senate Committee on
Energy and Natural Resources
Room 3121 Dirksen Building
Washington, D.C. 20510

Dear Senator McClure:

It has been brought to our attention that the budget at the T.V.A.'s National Development Center has been or will be drastically cut. In the past and at the present, the staff at T.V.A. has been a major source of information. They have the knowledge and a wealth of experience that is needed for the efficient operation of the Nation's fertilizer plants. It is a fact that U.S. fertilizer companies have to compete with foreign companies that are government subsidized or government owned. Losing any of T.V.A.'s ability to assist U.S. fertilizer companies in the areas of technical expertise places these companies at a serious competitive disadvantage.

T.V.A. has done much beneficial research and development work that, if discontinued in the future, would increase the cost of fertilizer due to the necessity of each company to duplicate T.V.A.'s existing research facilities. This in turn will place an additional burden on the farmers of the U.S. This duplication cost, along with less experienced people, will be much more expensive than the past budget for T.V.A. The phosphate fertilizer industry is depressed and we need the full support from T.V.A.

Yours truly,

Neil K. Christensen

Neil K. Christensen
Research & Development Supervisor
BEKER INDUSTRIES CORP.

NKC/kj

cc: Senator Pete Domenici
Senator Gordon G. Humphrey



517 Via Veneto
Venice, FL 33595

June 26, 1985

Senator Gordon J. Humphrey,
Chairman, Subcommittee on Regional and Community Development
of the Senate Environment and Public Works Committee
U.S. Senate, Washington, DC 20510

Dear Senator Humphrey:

This letter and the attached five pages of pertinent information have been written to gain your support for the work TVA is doing in the field of water-quality control. It is requested that this letter and enclosure become part of the TVA Oversight Hearing record.

I well realize you are very familiar with TVA's past accomplishments in general but perhaps you have not had the opportunity to become well informed as regards TVA's work concerning water quality. Since you may wonder why I presume to write to you concerning this subject let me tell you something of my background.

Although I have been retired for some 13 years now I feel I can still speak with considerable authority on this subject inasmuch as I worked for TVA for 36 years (1936-1972) with the last 23 years of this period spent directly in the field of water-quality control. During the last seven years of my TVA employment I served as Chief of the Water Quality Branch. Also, please let me add that at times during the later years of my TVA employment I served as an expert witness, in various legal proceedings concerning water quality, for the Alabama Water Improvement Commission before the Federal Power Commission, for a power company before the Illinois Pollution Control Board, and for the Tennessee-Tombigbee Waterway Development Authority in court. After I retired I served as expert witness for TVA's Division of Law before several courts. Additionally, I have written many technical papers on various aspects of water quality for presentation at local, national, and international engineering conferences. I hold degrees from the University of Illinois and from The Johns Hopkins University.

As I'm sure you realize, the quality of surface waters in the Valley is greatly influenced by the large reservoirs built by TVA. Some of these influences are beneficial but some are detrimental. Only experience accumulated over the years in dealing with the many influences of impoundment on water quality, and of the effects of domestic and industrial wastes from upstream sources on impounded waters (and vice versa), can provide the knowledge and judgment needed to solve the quality problems related to impoundments.

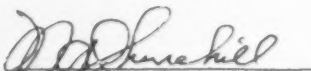
Of course, TVA's work in water quality encompasses much more than that involved directly with the reservoir system but I will limit my remarks to that important phase of the work.

Obviously, when impoundments are injected into a large river system (which has always been polluted to some extent with all kinds of liquid wastes) the water quality problems become much more complex. In the Valley these problems become uniquely TVA's problems and require solutions, in cooperation, of course, with the appropriate state organizations, by the agency operating the system of impoundments. As is evident to some extent from the attached information, local Valley states and organizations recognize and take advantage of the work TVA is doing in this field.

Should TVA's water-quality control activities be reduced or eliminated the quality of the environment in the Valley will suffer. The high level of expertise now available in the TVA staff for solving Valley problems was not developed overnight and should it be lost to the Valley it could not be developed again for many years to come.

The Tennessee Valley now has the water quality control expertise needed to address pressing and developing water resource problems. Please don't let the Valley lose it.

Respectfully,

A handwritten signature in dark ink, appearing to read "M.A. Churchill", written over a horizontal line.

M.A. Churchill

WHY AND HOW DO IMPOUNDMENTS AFFECT WATER QUALITY? CONSEQUENCES?

To answer these basic questions an understanding of thermal stratification in a deep reservoir is requisite. During the colder winter months in the Valley the reservoirs are not stratified, i.e. the temperature of the water from surface to bottom is essentially the same and so the water mixes from surface to bottom. However, when spring arrives the inflowing water warms up, and the surface layers of the pool begin to warm up also. The warmer, lighter water literally floats on the colder, dense water below. Thus thermal stratification begins and continues until winter.

Perhaps the single most important effect of deep impoundments on water quality is that concerning dissolved oxygen (DO). As vertical circulation of the water is stopped in the spring of the year the water in the colder deeper layers is blocked off from access to oxygen in the air. Consequently dissolved oxygen in the deeper layers is gradually depleted by the decay of organic materials initially present in, and organic matter settling later into, the colder waters. Since the power outlets in the dam are of necessity located near the bottom of the dam, the DO concentration in water released during the warmer months of the year is lower than desirable for downstream aquatic life (fish, primarily) and for the natural assimilation of any organic wastes added to the river by cities and industries located below the dam.

In water released from 17 TVA reservoirs concentrations of DO fall below 5 milligrams per liter (the minimum level needed by a healthy stream) for one to 5 months each year. Below seven reservoirs concentrations drop below one mg/l at least on one day each year. In open river reaches below the dams the flowing water gradually absorbs needed oxygen from the air but this process is slow and many stream miles are required to reoxygenate the low DO water to acceptable levels.

The colder water released from the deep pools during the summer months is beneficial to industries and power plants using the water

for cooling purposes. However, it is detrimental to warm water fishes. In the Valley, some 40 stream reaches (and some 600 river miles) are thus adversely affected.

Power operations during the summer months create recreational problems downstream from several deep reservoirs due to the sudden changes in water temperature thus produced.

Soluble iron and manganese in the water released from the bottoms of a few deep reservoirs have caused problems in water supplies due to the staining of plumbing fixtures and of clothes laundered in the water. In normal streams the minerals exist in an insoluble state and cause no problems in water supplies but these minerals are put into solution in water devoid of dissolved oxygen.

Reservoirs are excellent settling basins and consequently trap and hold most of the silt and other turbidity-producing materials. Soil particles settle out of suspension in the quiet waters and thus the released waters are much clearer and more attractive.

Bacteria contained in raw (or even treated) sewage die off in the pools. Thus the reservoirs are excellent barriers between upstream pollution and downstream points of water use.

Reservoirs are quite effective in smoothing out high concentrations of all forms of undesirable mineral pollution (e.g., salt, hardness-producing minerals, etc.)

Nuisance-level growths of algae can and do occur in some pooled waters whereas in free-flowing streams such problems are rare. Naturally the problem is greater in reservoirs having above-normal concentrations of plant nutrients in the water.

CAN THE MAJOR PROBLEMS BE SOLVED IN A FEASIBLE, COST EFFECTIVE MANNER?

Undoubtedly, the low DO situation below many of the dams is the most serious water quality problem due to impoundment. One technique for solving this problem involves injecting pure oxygen into the lake waters through many fine-pore diffusers located on the lake bed a

short distance upstream from the turbine intakes. Field-scale experiments, augmented by laboratory experiments, have been conducted in Fort Patrick Henry Reservoir above Kingsport, Tennessee, beginning in the early 1970's. The main conclusions gained from these experiments are that while it is physically possible to solve the problem this way it is very doubtful that the cost (several hundred thousand dollars per year) can be justified.

In the last few years much additional work has been done by TVA on the DO problem. The work done up to September 1984 is summarized in a report "Improving Reservoir Releases". This report points out that TVA has tried various schemes to draw air into the water passing through the turbines (draft tube venting, turbine hub baffles, etc.) and compressed air has been pumped into the turbines. Results have been very encouraging. In fact, the report says "TVA has been asked to supply information to help other parties clarify either the feasibility of turbine aeration or define the method for doing so. The information supplied by TVA has been used by projects in California, Alabama, Pennsylvania, Kentucky, South Carolina, Arkansas, Idaho, and Canada. In addition, details supplied to EPA have helped them to better define their perspective in assessing water quality below reservoirs. The United States Army Corps of Engineers provided partial funding for publishing a report prepared by TVA describing the state-of-the-art in hydropower release aeration throughout the world."

This is real progress.

WHAT DO VALLEY STATES THINK OF THE WATER QUALITY PROGRAM?

It is obvious that the Valley states, cities, and organizations feel the work TVA is doing in water quality is quite valuable and should be continued. Evidence of this feeling is shown in the following excerpts. Many more such illustrations are available.

Resolution by Tennessee Water Quality Control Board - "The Reagan Administration's proposed 70 percent cut in TVA non-power programs

would have a 'serious impact' on water quality in Tennessee, the state Water Quality Control Board said in a resolution adopted Wednesday TVA has taken the lead in developing management plans for their reservoir system and been a proven leader in research and development of ways to handle water quality problems, said David McKinney, manager of the water management division's East Tennessee office. TVA has also provided technical assistance, field support, laboratory and analytical capabilities to state water quality program 'Some of the biggest problems are projects we're involved in now are with the (TVA) water resources group.' McKinney said. 'Without this type of support, our ability to deal with these major problems is greatly diminished.' By Martin Burkey, Nashville Banner, March 14, 1985.

Tennessee Wildlife Resources Agency - A letter dated December 4, 1984 to TVA Chairman C.H. Dean from Gary T. Myers, Executive Director Tennessee Wildlife Resources Agency states, in part:

"Reservoir Management: Water problems at various degrees occur extensively throughout the TVA system. TVA has identified a good number of these problem areas, and the report commits them to a program on a substantial number of these. We look forward to seeing improvements in a number of the reservoir and tailwater conditions, and we hope that TVA can accelerate the installation of reaeration devices that improve the dissolved oxygen concentrations in tailwater discharges.

Technical Assistance: The limitation of resources tends to have a greater impact on small communities, but regulatory and management agencies are often burdened by the lack of adequate manpower, money, and facilities. TVA can offer a broad array of technical assistance to small communities, governmental agencies, and perhaps to the academic community through this program."

Tennessee Department of Public Health - A letter dated February 20, 1984 to Bevin Brown, Director, TVA, Division of Water and Water Resources from D. Elmo Lunn, Director, Division of Water Management, Tennessee Department of Public Health states, in part: "The Division of Water Management is expending a priority effort to bring Bristol, Johnson City, Elizabethton, and industrial contributors into compliance with the State's water quality act. In order to make the proper resource management decisions, there are areas of expertise, such as state of the art modeling, in which TVA is uniquely qualified. Your consideration of this request for assistance is appreciated."

June 25, 1985

Hon. Gordon J. Humphrey
Committee on Environment and Public Works
Subcommittee on Regional and Community Development
United States Senate
410 Dirksen Building
Washington, DC 20512

Dear Senator Humphrey:

I am writing in support of the Tennessee Valley Authority, I respectfully request that you include my letter in the proceedings of the oversight hearing on TVA, July 15-16 and 22, 1985.

I appreciate this opportunity to express my opinions about some of the programs of TVA. I will confine my remarks primarily to TVA's work in agriculture, and more specifically to the agency's leadership role in soil and water conservation, and fertilizer research and development.

I am a fulltime commercial farmer in Lauderdale County, Tennessee, where I was born and reared and have lived all of my life. For the past eighteen years I have served as a supervisor of the Lauderdale County Soil and Water Conservation District. I also recently served four years as President of the Tennessee Association of Conservation Districts.

Through my experience in working with TVA in areas of soil and water conservation and other agricultural programs, I have developed a great respect for TVA as an agency of government. Since Congress created the Agency in 1933, one of the primary missions of TVA has been to conduct agricultural programs to more fully develop natural resources of the Tennessee Valley and to conduct fertilizer research and development programs to help this Nation's farmers.

Conservation of our region's soil and water resources from the beginning has been a vital part of TVA's work. Years ago, soil erosion had devastated much farmland in the Tennessee Valley. Through cooperative programs with the Soil Conservation Service, Cooperative Extension Service, and many others, much progress was made in this area of work. However, a number of things have happened in the past 15 years that have adversely affected much of the earlier conservation work. Economic pressures have forced farmers to use their land more intensively than ever. The worldwide demand for grain crops, and programs of USDA encouraged farmers to shift land from permanent vegetation to high value row crops. As a result, alarming rates of soil erosion again cropped up in the Tennessee Valley region, as well as in many other farming areas of this country. For instance, in 1979, West Tennessee was among one of the Nation's worst erosive areas with average erosion rates of about 17 tons per acre per year. Some fields were losing 35 to 40 tons of soil per acre annually, about ten times the rate that we can tolerate and still maintain production. Similar problems were evident in Mississippi, Alabama and Kentucky.

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Sen. Gordon J. Humphrey
June 25, 1985

TVA was one of the leaders in helping plan and implement the successful West Tennessee Management and Conservation Education Program in 1979. Results of the program have been dramatic. Average erosion rates on cultivated cropland have declined about 4 tons per acre per year. This is saving more than 12 million tons of soil annually in the region.

I am enclosing a copy of a recently published report showing results of the West Tennessee program. I call your attention to pages 4 and 5 of this report which give an executive summary of accomplishments.

This West Tennessee work has been so successful that TVA has taken a leadership role in extending the program into all Tennessee Valley counties in a program entitled "Land and Water 201" that encompasses the 201 counties of TVA's power service area. Experiences learned in West Tennessee are unique and could well serve as a model for soil and water conservation programs anywhere in the U. S.

This work urgently needs to be continued. Once we lose the productive capacity of our soils, we will never regain them in our lifetime and perhaps we never would.

Another major responsibility of TVA is to research, develop, and introduce new fertilizers and technology. As a farmer, I assure you that this work has been a vital factor in the production on my farm, and many others in Tennessee as well as throughout this Nation. During the past 30 to 40 years, TVA has successfully developed and introduced new fertilizer granulation technology, improved processes for making fluid fertilizer, higher analysis fertilizers, more efficient manufacturing processes, and higher quality fertilizers. TVA is credited with originating 75 percent of the current fertilizer technology being used in the fertilizer and farming industries today. This is very significant and is work that I feel must be continued.

As I am sure you know, farmers today are under severe financial pressures. It is vital that we have continued research and development of fertilizer technology if farming is to survive. If farmers do not survive, neither will other industries and businesses in this country.

Work that TVA is researching now in fertilizer efficiency, fertilization associated with minimum till crop production, and finding ways to use low grade phosphate sources are absolutely essential for the future of this Nation's farmers. As a nation, we are rapidly depleting our deposits of high grade phosphate ore. We must find ways to use our abundant supplies of low grade phosphate to keep from becoming dependent on imports from foreign countries unless we want to have another fiasco similar to our imported oil problems of a few years ago.

I know there are always ways to improve any agency or business. However, I feel that TVA has made important contributions to agriculture throughout Tennessee, as well as this Nation. The Agency's work should be continued.

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Sen. Gordon J. Humphrey
June 25, 1985

The survival of farming is basic to this Country, and, as a farmer, if we are to survive, we are going to need more fertilizer research programs and programs to preserve our farmlands such as I have discussed earlier.

Thank you for this opportunity to share my thoughts and position on TVA with your committee.

Sincerely,

Talmage C. C. C. C.
Talmage C. C. C. C., Jr.

CC: Senator Jim Sasser
Senator Albert Gore, Jr.
Congressman Ed Jones
Congressman James Quillen
Congressman John Duncan
Congressman Bart Gordon
Congressman Bill Boner
Congressman Don Sunquist
Congressman Harold Ford
Congresswoman Marilyn Lloyd
Mr. Charles H. Dean

Signal Mt. Tenn.
 July 9, 1985
 Hon. Gordon Humphrey,
 United States Senate,
 Chairman, Sub Committee
 Regional & Community Development,
 Washington, DC 20510.

Sir:

With reference to your hearings on the Water Quality Programs of TVA I shall appreciate the opportunity to relate for the record some of the background and the activities of this Segment of TVA.

At the beginning of TVA the late Eugene L. Bishop MD was the Commissioner of Health of Tennessee. He was persuaded to give up this position and become the first Director, Health and Safety Department. Dr. Bishop was highly regarded by the Medical Profession, was an esteemed member of the State and Territorial Health Officers Association, skilled in the Control of Communicable diseases, an able and demanding administrator and a firm believer in the sovereignty of the State.

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He surrounded himself with able physicians, nurses, engineers, and other scientists and technicians, many of them with health department experience and advanced degrees and showed the world what could be accomplished in stream sanitation and malaria control.

No specific stream pollution control legislation existed in the Valley States and he set down with the Senior State Health Officers and a plan was considered. TVA's Stream Sanitation Section made the baseline surveys, marshalled and analyzed the data, wrote the reports and made the information available to the States for their use in obtaining stream pollution control legislation. Additionally, an engineer was loaned to the State of Tennessee; he never came back but served a most useful purpose. He became the first Secretary of the State Stream Pollution Commission and Director of Stream Pollution Control in the State Health Department.

As more definitive stream

were needed to pinpoint sources of pollution, to identify the components and to measure the strength of the wastes from industries and municipalities, that pattern of collaboration and cooperation was extended. Prior to any studies of wastes from outfalls, IWA Staff met with the State Sanitary Engineer and requested their assistance in notifying industries and municipalities.

At Dr. Bishop's invitation thru my Supervisor, the Commissioner of Health of Kentucky, I became the Assistant Chief of the Stream Sanitation Section in 1947. I served as Chief, later as Chief Public Health Engineer and finally as Assistant to the Director, Environmental Research and Development at age 65 in 1970.

It was a practice of long standing for plans of proposed IWA wastewater treatment facilities to be provided to the appropriate State Sanitary Engineer for his review, comments and file. When Executive Order 11258 was issued requiring waste water discharges

practices of all ¹ Federal Agencies
to conform with state regulations
I believe TVA was at the top of the
list or nearly so. Throughout
the years there have been many
instances of collaboration with
the Public Health Service, the
EPA Environmental Center and the
Environmental Protection Agency

Significant contributions have
been made to the literature of the
A.S.C.E. various journals on the stream
pollution control field and to state,
regional and national associations.
My successor in the Stream Sancti-
tion staff was a participant in
a workshop of four states at Meriden.
Some of those with whom I served
are present employees of the Water
Quality Branch and I am
confident the same high quality
standards of training, experience
and devotion to duty yet prevail.

Thank you very kindly for
this privilege of sharing this
information.

Sincerely,

Craig M. Davidson
115 James Blvd
Birmingham AL 35207

Development Authority Of Union County

P. O. Box 368
Blairsville, Georgia 30512

STATEMENT OF ROBERT W. JONES

TO THE SUBCOMMITTEE ON REGIONAL AND ECONOMIC DEVELOPMENT
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

Mr. Chairman and Members of the Subcommittee:

My name is Robert W. Jones. I am from Blairsville, which is located in Union County, Georgia. It is a small, rural county of some 9,000 residents in the Blue Ridge Mountains of north Georgia. I am here today to tell you about my hometown of Blairsville and Union County and the impact the Tennessee Valley Authority has had on this area. My family came to Union County in the early 1800s, settling there to take up farming. I am the fourth generation in my family to farm that land and make my life in Union County. For over 30 years now, I have been a farmer, a businessman, and a civic leader in my home county. I was one of the lucky ones in my family and my area in that I was able to go to college, receive a good education, and return home to start my own business. In addition to farming my family's land, I own and operate a general insurance agency in Blairsville that provides a decent living for me and my family. But so many others in my area are not so lucky.

Union County is like many other rural communities in Georgia and the Nation. It is very isolated. This isolation, combined with

limited accessibility, has been a major obstacle to economic development and bettering the lives of its people. Over the years, I have watched as our young people leave to continue their education or seek more gainful employment in the larger cities. They rarely return. We are losing the best and the brightest of our young people because we don't have the jobs to keep them there. The people who remain are some of the poorest, not only in Georgia, but the Nation. Union County is the second poorest county in Georgia. The annual per capita income for citizens of my county is \$5,138 -- this is 54 percent of Georgia and 46 percent of the National Average.

Mr. Chairman, the average citizen in my county makes less in one year than you, as a member of Congress, make in one month.

As grim as those statistics are, there has been improvement, and there is hope that in the years to come the people of Union County will see new industry and new jobs which will allow our young people to remain in the area if they wish. A great deal of the improvements, I believe, can be attributed to the Tennessee Valley Authority and its philosophy of helping people help themselves. Let me tell you briefly what we in Union County have been able to do with TVA's assistance. In the 1970s, the county's local leaders decided that with sufficient effort, something could be done about Union County's problems. We formed an industrial development authority which served as a local vehicle for project development and implementation. I am proud to say that I was one of the founders of the industrial development authority and serve as its chairman today.

The authority sought and received assistance from many agencies including the University of Georgia Extension Service, the Georgia Department of Industry and Trade, Georgia Division of Forestry, Blue Ridge Electric Membership Cooperative, Georgia Mountain APCD, the Appalachian Regional Commission, Farmers Home Administration, and the Tennessee Valley Authority. The list of demonstration projects that have started and are now prospering are, I think, impressive. They include a breeder swine project, a cash crop project, a high school greenhouse construction project which is being built and will be operated by the students at the school, and a project to provide heat to the elementary school using wood chips. These projects have helped our area farmers through better planning and marketing techniques and are providing our young people with real world experience in building and operating that greenhouse.

But, we on the industrial development authority realized that as impressive and constructive as these projects were, they were not creating new jobs in our area to help us retain our young people, put our unemployed to work, or helping our local tax base in any substantial way. With TVA's assistance and advice, the development authority decided to undertake the development of a 129-acre industrial park. With TVA's technical expertise, we were able to plan the park and map out our strategy for attracting industry to the area to provide jobs we needed. The Union County Industrial Park was completed in 1984 at a cost of \$1.5 million. It currently has 325 new jobs in four industries. While this would be a modest number of jobs compared to large cities, it has made a

considerable impact on unemployment in my county. Ten improved sites ranging from three to eight acres are currently available.

Cooperation between TVA and the local leaders of Union County that made the industrial park a reality is still alive today. Using modest funding from TVA and other sources, the development authority established a trust fund. This fund is used to loan money to industries locating in the Union County Industrial Park to help with startup and other expenses. In turn, the industry repays that loan with interest to the trust fund from which other local economic development projects can be funded. This rollover concept, using a modest amount of initial funding, is intended to enable a community such as Union County to become economically self-sufficient. I believe that this program, which was conceived and implemented by the Tennessee Valley Authority, demonstrates that a modest amount of assistance can leverage substantial payoffs for communities in similar circumstances as Union County. This concept has replication possibilities not only for the Tennessee Valley, but the Nation as a whole.

I have discussed with you only a few of the projects started with TVA's assistance in my county. But TVA provides so much more and they provide it on what I feel is modest Congressional funding. The agency provides assistance to small- and medium-sized industrial concerns wishing to expand. This is an important program to the Valley in that over half of all the new jobs created over the past 15 years were created by those small and medium industries. TVA's waste management program provides much needed assistance to local

communities wishing to establish State-approved sanitary landfills, waste collection centers, incineration centers, and recycling centers. The agency provides technical assistance to communities to find and stop costly leaks in their water systems. In today's world, when water is becoming more and more precious, the value of this program stands by itself. Through its many other community self-help programs, TVA is showing local governments and leaders how to identify community problems and solve them in the best way possible.

Before I close, let me share my thoughts with the committee on why I believe in TVA. While we in Union County are grateful for the assistance we have received from the many fine agencies in State and Federal government, that assistance is usually a one-time, limited effort. TVA, however, can come into an area and provide the know-how to establish a total economic package for an area. TVA does provide some modest financial assistance, but more importantly, they help us find the funding we need from private sector concerns. TVA also helps us put the leadership team together and show us how to make it work. This is the key to our success and TVA's success. No one project is going to save an area -- economic success takes years of planning and establishing multiple projects to ensure that success. TVA doesn't throw dollars at a problem -- the agency uses its expertise to solve the problem. What TVA had done and is doing in my home area can be repeated in any rural area in the Nation. Senators, instead of killing the Tennessee Valley Authority, shouldn't we be trying to use what the agency has learned over the past 52 years and demonstrate it in other parts of our great country? THANK YOU.

DUNGANNON DEVELOPMENT COMMISSION INC.

P. O. BOX 393

DUNGANNON, VIRGINIA 24245

July 1985

Congressman Rick Boucher
188 East Main Street
Abingdon, Virginia 24210

Dear Rick:

Enclosed is testimony for the Subcommittee on Regional and Community Development for the Tennessee Valley Authority. I would like to be able to present this myself but our organization cannot afford to send me. I feel confident that you will do justice to IVA.

The original paper was a term paper written by a student in English 112 and as a report for History 113 at classes held here through Mountain Empire Community College. She received an A++++. This person is a wife and mother of four children. She is very active within our community. Her work experience is in the textile industry and she is currently helping to organize Phoenix Industries. She is Wanda Duncan, President of the Dungannon Development Commission.

The paper we are sending is a condensed version with the most pertinent information in it. We, in Dungannon, wholeheartedly support this testimony.

If you need more information, feel free to contact me.

Sincerely,

Nancy

Nancy L. Robinson
Executive Director/DDC

cc: Phil Sharre
Jim Sasser
Ford Quillen
Jim Jones
Hon. Gordon J. Humphrey ✓

TESTIMONY FOR THE SUBCOMMITTEE ON
REGIONAL AND COMMUNITY DEVELOPMENT
FROM THE
DUNGANNON (VA) DEVELOPMENT COMMISSION

Dungannon is located in an isolated part of the mountainous coal country of southwest Virginia. Unemployment has always been high and we have never been able to afford many community improvements. But, we in Dungannon have a spirit of cooperation and a commitment to hard work that is overcoming these obstacles. The Dungannon Development Commission (DDC) is the group that pulls together local people to improve our community. We are a non-profit corporation and have received operating funds from various private foundations. The DDC was started in 1979 and serves about 1,700 people in the Dungannon area. We're not looking for handouts or giveaways. We only need a helping hand to help ourselves. We want to become a self-sustaining organization. This is what TVA helps us to do. They don't come in and tell us what to do, make promises they can't keep, or push programs with little flexibility. Their approach is to help us identify solutions to problems and provide whatever help they can. It's always based on us doing the work, it's their assistance that helps us get going. The DDC is truly a grassroots, people-oriented organization trying to better our community without dependence on government. TVA has the ability to help us, a small, isolated place, to do just that.

If President Reagan's budget cuts go through, TVA will not be able to assist small communities such as the Dungannon area. We here at the Dungannon Depot call TVA "The Silent Partner" because of what it does for small rural communities. People who are not involved with community projects do not know what TVA is all about.

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TVA has been a godsend to our area. TVA has provided wood stoves to the depot which keep us warm in the winter. It has provided help when we are in need, such as for the Phoenix Sewing Factory which will provide more jobs for people in the community. TVA is helping with the educational courses dealing with the sewing industry. The provision of the Phoenix building is probably the most important donation of all. It's been our job to move the building to Dungannon and erect it.

Many people in our area have no means of transportation. By this I mean they have no way of going places. This makes transportation a big problem in our area. But like always, TVA comes through for Dungannon by helping us start a transportation system with vans.

During the International Women's Exchange in 1984, TVA supplied vans to the Dungannon Development Commission (DDC) that was used to transport the women to various places in the area as well as to Washington, D.C. Not only were the vans donated, but the TVA retirees volunteered their time to drive the vans.

TVA has donated a van to Mountain Empire Older Citizens that is being used to bring food to the depot to be prepared for approximately thirty Senior Citizens in the area. Some of these citizens are not able or capable of cooking for themselves.

The DDC is planning a Summer Youth Program in the month of July. In order to best serve those underprivileged youths the program is designed for, transportation was a problem. So the Executive Director of the Commission, Nancy Robinson

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said, "Why not ask TVA for vans?" As always, TVA came through. It is supplying the commission with three vans. Two of the vans will be used to go to the child's home, bring him or her to the depot and then return them in the afternoon. The vans will also be used for various field trips the commission is planning, such as a trip to Barter Theatre in Abingdon, Virginia.

The third van will be kept at the depot for community transportation to take the people in the surrounding area to various places they need to go such as to the grocery store or doctor. Not only did TVA donate the vans, but once again a TVA retiree, Bill Keeney, came through by saying he would spend his vacation driving on of the vans for the Summer Youth Program. Bill is a godsend to us, he is always there when we need a helping hand.

TVA helped local people start the Clinch River Health Services Clinic. The Clinic was a much needed project as we had to travel approximately twenty to thirty miles to see a doctor. Now most of us can get to a doctor within five to ten minutes. TVA also surveyed the land for the new sewing factory.

When the new wafer board plant, Louisiana Pacific (LP) dediced to establish a plant here, TVA came through by helping them in their location. TVA provided LP with data showing the availability of the yellow poplar resources required by their firm. The LP plant will mean approximately 200 more jobs in the area.

-4-

When we had the flood in 1977, Fort Blackmore and Clinchport, Virginia were declared a disaster area as a result of the flood. With the help of TVA, approximately thirty-five residents are now relocated to the Duffield area. By relocating the residents, the friends are still together in their cozy trailer court, feeling very content.

If President Reagan's budget cuts go through, what will we as small communities do? Can we seek help elsewhere? But where would we find another agency that has helped us like TVA?

This is really a sad moment for some of us here in our community. We are all thankful to TVA for all it has done for us. We could help agencies like TVA by taking citizen action. It's important that we write our legislators and let them know, not only of the good TVA has done, but of the loss to communities like Dungannon that the budget cuts will create.

I know that I have made TVA sound perfect, but when you live in a small community as I do, you can find no wrong in an agency that helps like TVA. I know deep down that TVA is not perfect because of the problems it faced from the start. But all in all, TVA is as helpful as an agency can be. Thank you for accepting this testimony.

Floridin

A Member of the ITT System

Floridin Company

Berkeley Springs, W. Va. 25411
Telephone: (304) 258-2500

June 13, 1985

The Honorable Gordon J. Humphrey
United States Senator
Committee on Environmental and Public Works
Subcommittee on Regional and Community Development
United States Senate
410 Dirksen Building
Washington, DC 20512

Dear Senator Humphrey:

I am writing to you in support of the National Fertilizer Development Center of the Tennessee Valley Authority (TVA). I respectfully request that this letter be included in the proceedings of the Oversight Hearings on TVA, July 15, 16 and 22, 1985.

I am very familiar with the work done at the TVA National Fertilizer Development Center. We at Floridin Company have been associated with this branch of TVA for about 35 years and know that throughout this period they have performed a superb job in the development of fertilizer technology and various aspects of agricultural research and development. This letter reflects my concerns about the recent reports of proposed budgetary restrictions to be imposed on the TVA and its National Fertilizer Development Center.

Although no one can predict the future accomplishments of the Center, I believe that past and current performance is a good measuring stick. I have listed some of these previous and current developments below that we at Floridin Company find very impressive.

- (1) The center was the originator and implementer of clay stabilized liquid suspension fertilizers. This invention has resulted in major advances in the fertilizer field that have been passed on to farmers. The use of the technique has resulted in fuel savings, lower costs, more uniform pesticide and fertilizer applications and improved crop yields.

FULLER'S EARTH • ATTAPULGUS CLAY

- (2) The invention and introduction of the TVA "T" and cross reactors for manufacturing fertilizer ingredients from the most inexpensive raw materials. The use of these novel devices throughout the industry, at home and abroad, has resulted in better fertilizers, larger crop yields and better economics.
- (3) Slow release nitrogen fertilizers were developed in the TVA sulfur coated urea program. These are economical alternatives to vastly more expensive forms of fertilizers that provide more lasting fertilization on farm acreage.
- (4) The development of special, effective fertilizer blends has been addressed by the Fertilizer Development Center. The Center developed processes for manufacturing these compositions from available and inexpensive raw materials.

Many other significant contributions could be stated. However, of particular interest to me is their outstandingly good relationships with the public--farmers, the fertilizer industry, other agricultural scientists, universities and other agencies. TVA personnel are not only interested in the furthering of agriculture through their pioneering efforts but have shared the fruits of their efforts throughout the United States and the world. They are the recognized experts in the U.S. in the development and application of fertilizer compositions and applications. They share this knowledge through consulting, meetings and a system of licensing. At this time technology pioneered by the National Fertilizer Development Center is involved in at least 73% of the fertilizer used in the U.S. Their efforts with chemical fertilizers has been a major factor in enabling the U.S. farmer to become the most efficient large-scale producer in history.

During the 25 years that I have been visiting TVA, I have gained a high respect for their one-of-a-kind facility at Muscle Shoals and for the high caliber of their chemists, engineers, and other agricultural scientists. Their constant aim is to improve the economics of farming, to increase farm output, to improve the utilization of plant nutrients and to correct deficiencies in soil fertility. A good motto for them would be "If You Have Eaten Enough Today, Thank TVA."

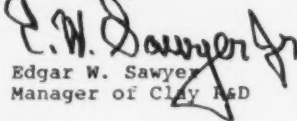
Senator Gordon J. Humphrey

-3-

June 13, 1985

As you can tell from the above comments, we feel that the TVA National Fertilizer Development Center is one of the finest agencies in the U.S. A reduction of their budget will curtail future and necessary agricultural development and food production in the U.S. and throughout the world. I strongly urge you to maintain and, if possible, increase their funding. I am sure that this will result in liberal rewards in the fight against worldwide famine.

Sincerely,



Edgar W. Sawyer
Manager of Clay R&D

EWS:gb

cc: Senator William L. Armstrong
Senator Rudy Boschwitz
Senator Nancy L. Kasselbaum



The University of Georgia College of Agriculture
Experiment Stations • Georgia Mountain Branch Station

ROUTE 1, BOX 44/ 1005
BLAIRSVILLE, GEORGIA 30512
404/745-2655

June 12, 1985

Honorable Gordon J. Humphrey
Committee on Environment and
Public Works
Subcommittee on Regional and
Community Development
United States Senate
410 Dirksen Building
Washington, D.C. 20512

Dear Senator Humphrey:

This letter is in support of the Tennessee Valley Authority. I respectfully request that you include my letter in the Proceedings of the Oversight Hearings on TVA July 15, 16, and the 22nd of July 1985.

The recommendation of reducing TVA (Office Agriculture Chemical Development) from 49.5 million dollar 1985 funding to 10 million for FY86 would eliminate all programs except fertilizer research. Even this program would be severely affected in that no funding would be available for transfer of technology to the fertilizer industry. All construction of new facilities for promising new fertilizer processes would be stopped. The National Fertilizer Development Center at Muscle Shoals is the forerunner in the development of new economical high grade fertilizers. The reduction in the program would eliminate all but about 100 of the current 985 jobs at the National Fertilizer Development Center, and approximately 100 positions at cooperating universities throughout the country would be eliminated or severely reduced. The elimination of the Hardwood Fuels program would result in the loss of an extensive research effort not yet completed and over a four million dollar investment in a partially completed pilot plant. I cannot see the feasibility of terminating a program which offers so much in fuel technology especially after so much has already been invested.

Honorable Gordon J. Humphrey
June 12, 1985
Page 2

The Home Garden program in 1986 would finance 12,000 home garden demonstrations for low income families and the handicapped at a TVA contribution of \$30 per demonstration. Best estimates are that these deprived families harvest \$600 of nutritious food from these gardens. This program not only aids in the nutritional needs of these people, but also provides them with pride of accomplishment.

TVA has always shown a deep concern for soil and water conservation. Soil erosion is a great problem throughout the Valley counties. Recently TVA has assumed a leadership role in a multi-agency effort (Land and Water 201 program) to reduce serious erosion across the Valley counties to demonstrate how erosion control practices can be incorporated in practical farming operations. There are currently 200 Resource Management farmers enrolled in this program and over 250 conservation tillage demonstrations underway.

In the Farm Demonstration program, TVA provides technical and farm management assistance to about 570 cooperating farmers throughout the Valley. These demonstrations serve as a role model to hundreds of farmers in the region.

Elimination of the Agricultural Resource Development program would stop 600 additional demonstrations designed to show potential for new high income crops, marketing development, and other enterprise demonstrations. All of these demonstrations are aimed at modernizing agriculture in the Valley and keeping small farmers competitive. Elimination of these programs would also result in the loss of 121 jobs at the region land-grant universities.

For many years TVA has been supportive of research and extension programs at the Georgia Mountain Branch Experiment Station, a unit of the University of Georgia. These programs planned to aid farmers of the mountain and surrounding counties of Georgia have been of mutual benefit to the Station and TVA in reaching objectives. As an example, a winter feeding program to carry calves to heavier weights using different feeding systems has resulted in local cattlemen carrying thousands of cattle to heavier weights and realizing profits of over \$50 per head. A new modern swine facility opened in 1982 for the production of feeder pigs funded by TVA has attracted several hundred visitors, many from foreign countries. This facility offers training and technology for swine producers, extension personnel, and youth groups. It also demonstrates how swine producers can use this information to upgrade their respective swine operations.

The University of Georgia has just entered into an agreement with TVA to conduct extensive research and demonstrations on vegetables and small fruits at the Mountain Station and on farmer fields to develop new technology on existing crops and potential for new ones. The end result

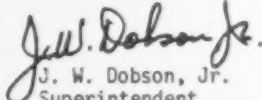
Honorable Gordon J. Humphrey
June 12, 1985
Page 3

of this investigation is to increase income through increased production and improved marketing. Loss of TVA funding would halt or severely minimize this effort and greatly reduce the effectiveness of ongoing programs. The Mountain Station would stand to lose two positions funded by TVA.

In addition to agricultural pursuits, the Research Development program has played an active role in creating new industries and jobs across the region, led the way in protecting the environment, provided needed assistance to county and city governments, and aided in rural community services and opportunities.

One wonders just what the economy of the area known as the Tennessee Valley would be like today without the influence of TVA programs. It would be most unfortunate to impede the impact which these programs have and will continue to have on this area as well as their influence at the national level. I strongly recommend that funding be restored to the FY85 level.

Sincerely,


J. W. Dobson, Jr.
Superintendent

JWDJR/bh

June 12, 1985

Michael R. Hancock
830 Kent
West Lafayette, IN 47906

Gordon J. Humphrey
Committee on Environment and Public Works
Sub-Committee Regional and Community Development
U. S. Senate
410 Dirksen Bldg.
Washington, DC 20512

Dear Senator Humphrey,

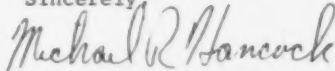
I am writing in support of the Tennessee Valley Authority. I respectfully request you include my letter in proceedings of the domestic hearing of T.V.A. July 15, 16, and 22, 1985.

The functions of the Tennessee Valley Authority have had, and continue to have, a significant impact throughout this country and on an international purview. Their assistance in education, research, analysis and information dissemination has benefited the total agricultural sector. It is also notable that T.V.A. active participation in agri-related tests, seminars, and states sponsored training sessions has contributed significantly to the credibility and value of these activities.

To view the Tennessee Valley Authority as benefiting only a single state or small sector would be inaccurate. To let the single state premise impact on budgetary decisions would adversely effect a large sector based on this inaccuracy.

I urge you and your committee to review the effect of budgetary constraints on the ability of the T.V.A. to perform a necessary function and the resultant impact on the many served by this organization. Please reconsider your present direction on this important matter.

Sincerely,



Michael R. Hancock
Agricultural Products Operations Mgr.

MRH:slw

5508 Fifth Street
Knoxville, TN 37918
Phone: 615-688-8567

Senator Gordon Humphrey
Senate Office Building
Washington, D.C. 20510

July 12, 1985

Also attention of: Mark Haynes, Staff Director
Gordon MacDonald, Legislative Assistant
both of The Subcommittee on Regional and Community Development

Dear Senator Humphrey:

This is in regard to your oversight hearings into TVA activities.

Although the hearings are to be broken into Environmental, Economic, and Agricultural issues, without mention of electric power production by TVA, my comments do reference the viciously ignorant means to electric power used by TVA. By crude analogy, I would consider it to be absurd to discuss the sex life of flowers with a restriction to not mention the stamen or genitalia.

The several details which I think need to be brought forth in hearing are presented for consideration herein in an almost ascending order of gross imposition by the TVA upon the public of the Tennessee Valley. The details are four, in number, following.

1.) At no time since the initial organization of TVA has the fundamental resource, -- fundamental RENEWABLE resource--, of the area been openly and publically recognized as such by TVA. Approximately 60% of the TVA's area is forested area, in a long growing season area and also a high rainfall area, -- truly more suitable for high annual yield forest growth than more Northern areas, and more suitable than less watered areas to the South. And yet in 1985 the technical climate of forestry as practiced in the area has not advanced from that of over fifty years ago, in regard to forest productivity per acre-year.

a.) No effort has been made toward appropriate forest fertilization techniques, -- such that the wood volume per acre-year can have advanced from the less-than 40% of its realistically expected yield that exists.

Senator Humphrey

Page 2.)

July 12, 1985

b.) No effort has been made toward finding and applying an appropriate technique of plant hormone growth stimulation for forest woods. For example, the TVA technical library for its publically paid "scientists" includes all of three books in reference to plant growth hormones, -- including one volume from the 1930's!

c.) No effort has been made toward, again, appropriate means of harvesting mature trees from hillside forests without knocking down the whole-of-the-woods, in a mechanized destructive way that is more damaging than the un-mechanized methods of yesteryears. The need of a simple state-of-the-art hot gas balloon, -- as a tethered sky-hook--, for forest-saving precise harvest of individual trees, and downed timber from storms, has not been recognized by TVA. (Alas, TVA is not alone,-- the head of the UT Forestry Dept., and others, glibly stated in 1974 that "the Federal Government was working on aerial logging techniques", ---- but there are none in the valley in 1985!)

Partially as a result of the above noted lacking of intelligent efforts, use of the "natural-carbon-cycle fuel", woody plants, has not been properly employed for electric power production in the TVA's area.

2.) There is a demonstrated slovenliness of the publically paid TVA administrators in their lack of attention to the quality of the water of the Tennessee River's series of lakes and its upstream tributaries' lakes. This slovenliness is easily observed at the level of the appointed directors of the TVA. The directors' own drinking water supply in their headquarters offices in Knoxville, Tennessee is from the flotsam-and-jetsam littered mud-banks of the upstream lakes. None of the directors have ever made the suggestion or effort toward a regular clean-up of the filth in evidence for all to see during the low-lake-level season from Fall to Spring!

The lack of quality of the directors and administrators of the TVA may be demon-

Senator Humphrey

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strated by their caring for the use of the water in the lakes below Knoxville, where they have been a party to the dumping of "radioactive cess", euphoniously called "radioactive liquid effluents", from nuclear electric power plants. Inturn they have endorsed the monitoring of the levels of such "cess" for those that drink and eat from the downstream lakes.

The TVA has made no attempt to even examine any imaginative technical means toward silt control and recovery from the lakes, nor means to give the lakes a true productivity of import to the area. I suggest some several obvious candidates:-

- a.) Water inflated fabric-dams for control of minor stream silt inputs.
- b.) Electric silt recovery techniques
- c.) Deliberate local lime additions for controlled sedimentation
- d.) Electrolytic oxygenation techniques
- e.) Intentionally grown and harvested water-plants both for water quality control and potentially sufficient "natural-carbon-cycle fuel" to more-than fuel the electric system

3.) Within your catagory of "Economic" issues it may be well to spotlight the TVA's so-called "enterprise development programs", -- from which the record can speak for itself. There are two sets of figures that should become public, as examples of TVA in-action.

- a.) The total budget for such activity versus the actual dollars provided to private business, as an example of the cost-of-administration.
- b.) The same budget total versus the gross dollars of business done by the private firms so "developed", for example of cost-effectiveness.

Also, in particular the TVA's funding of a purely self-serving operation by the title of Energy Opportunities Consortium should be examined as example of very possible "cheating at the public trough" by some of the "gentlemen" of the area. Hopefully you have the resources to compile more complete and detailed examples of the TVA's abuse of money extracted from outside the valley than I have put down herein within my limits as an individual, ungrouped but observant.

Senator Humphrey

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July 12, 1985

Sure, TVA has provided some "jobs" that have kept some of the local "plantation owners" from grinding the economic level of "the-many" even lower than the low relative position in the nation. But perhaps it is time to turn "the-many" loose on "the-monied-few" and stop the "use" of the TVA as a buffer between "the-many" and those relatively few others, in one view.

4.) The TVA exists in fact as a monopoly supplier of electric power. In that role the TVA can rightly and properly be said to have cheated, defrauded, and sabotaged the people of the valley by the deliberate acts of building electric power plants which use Uranium fuel that must be imported into the valley. That is, by exporting money from the valley for a fuel which becomes a vicious life-threatening waste and which could have been and may yet be substituted for by renewable forest resources of the valley.

If you hesitate to accept the use of the word "sabotage" as realistic, then please consider the approximate 2000 TONS of spent nuclear fuel bundles that exist now in the Browns Ferry cooling pool, --- consider them as placed centrally in your home area. In fact, the TVA's building-in of the Browns Ferry's waste nuclear fuel bundles has been THE ULTIMATE SABOTAGE for more than just the Tennessee Valley! Can there be an effective "defense" when such wastes become the "target" for violent action by even one intent individual? A partial draining of the cooling pool, effected by readily available one-man weapons, results in a steam driven eruption of the wastes for disbursal to the clouds, winds, and local waters. In effect, "everyone East of the Mississippi River and in Eastern Canada lives in the Tennessee Valley". (Isn't it also something like THE ULTIMATE FRAUD to claim security by means of some defense systems when such as the TVA's nuclear wastes are as they exist?)

Certainly there is need to test constructive, imaginative, technical schemes which have the potential to bring the valley's residents to the average level of the nation, in the facets of their lives, -- and which have value for export to other areas.

Senator Humphrey

Page 5.)

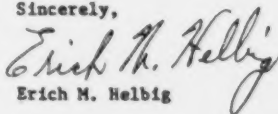
July 12, 1985

Intellectually, effectively, and philosophically the existing TVA fails the valley and the nation. That is, in reference to the immediately preceeding comment. In one view, there is no way in which the existing operation of the Authority could be made environmentally forward-going; — it will always remain a government entity that has to be dragged into the real world each day and away from some half-baked, poor-mouthed substitute for proper actions, as with the example of the "tall stacks solution" to power plant wastes which was no solution in fact.

Privatized effector groups may be an effective replacement for more oversight than there is time and means for Congress to effect with a continuing TVA, I would suggest. Such an "effector group" might even bring into practice the "natural-carbon-cycle fueled"(ethyl alcohol fueled) fuel-cell-employing private electric supply, for both agricultural and industrial exemplary utilization of the valley's capacities. (Or are these units to become another imported technology for the nation?) (And another TVA failure to respond to today's technical realities, while it continues to emphasize large systems, large inflexible systems?)

Hopefully serious federal level consideration will be given to the constructive intent for the valley of my personal words-on-paper herein, and special deliberation given to my four questions herein, for the benefit of the nation. As it is now, for the private citizen, no foreign government has as insidiously threatened the individual and family, and business, and such on the nation's roads, as this federal government! That is, by its inappropriate pursuit of technology in part by means of such agency as the TVA, with unfortunate real national impact from TVA actions. May your actions be more effective than my words. Thanks for your attention and efforts.

Sincerely,



Erich M. Helbig

Copies: Certainly!



International Association
of
Fish and Wildlife Agencies

July 26, 1985

The Honorable Quentin Burdick
Subcommittee on Regional
and Community Development
Senate Environment and Public Works Committee
Dirksen Office Building
Washington DC 20510

Dear Senator Burdick:

I appreciate the opportunity you are affording me to offer a statement on behalf of the International Association of Fish and Wildlife Agencies for the record of the July 30 oversight hearing on the activities of the Tennessee Valley Authority.

It is attached herewith for your consideration and that of your colleagues and with the hope that it will be helpful in your evaluation of the agency and its objectives.

Sincerely,

Jack H. Berryman
Jack H. Berryman
Executive Vice-President

President—RUSSELL A. COOKINGHAM
CN 408 Trenton, NJ 08625
First Vice President—GARY T. MYERS
P.O. Box 40747, Nashville, TN 37204
Second Vice President—JOHN R. DONALDSON
P.O. Box 3603, Portland, OR 97208
Secretary-Treasurer—CHESTER F. PHELPS
128 Winchester Drive, Savannah, GA 31410
General Counsel—GLENN L. BOWERS
221 Mountain Road, Dillsburg, PA 17019

JACK H. BERRYMAN

WESLEY F. HAYDEN

JOHN S. GOTTSCHALK
1412 16th Street, N.W.
Washington, D.C. 20036-2226
Telephone
(202) 232-1652

Chairman—ROBERT M. BRANTLY
620 S. Main Street, Tallahassee, FL 32301
Vice Chairman—FRANK LOCKARD
600 N. Capitol Way, Olympia, WA 98504

C.D. BELADRY, Secretary, WI
VERNON BEVILL, Raleigh, NC
JOHN R. CROGAN, Wakefield, RI
HERBERT DODG, Albany, NY
BILL HANZLICK, Pratt, KS
BERTRAND TETREAU, Ottawa, Ontario

STATEMENT OF JACK H. BERRYMAN, EXECUTIVE VICE-PRESIDENT
INTERNATIONAL ASSOCIATION OF FISH AND WILDLIFE AGENCIES
FOR RECORD OF HEARINGS BY THE SENATE SUBCOMMITTEE ON REGIONAL
AND COMMUNITY DEVELOPMENT ON TENNESSEE VALLEY AUTHORITY PROGRAMS
JULY 30, 1985

Dear Mr. Chairman: Speaking for the International Association of Fish and Wildlife Agencies, I welcome the opportunity of sharing with you and your subcommittee colleagues our assessment of the Tennessee Valley Authority's operations, programs and objectives.

As an organization committed to the cause of sound and balanced resource conservation and management, we and our fish and wildlife members in each of the 50 states have had occasion to work in close cooperation with the TVA over a long period in those areas in which we have a mutual interest and concern.

Our evaluation of the agency, as reflected in the following observations, is based on that experience.

TVA's greatest strength is in the dynamics of its current program. Here is an agency working close to the people it was established to serve, applying the latest technology and scientific understanding to:

Improve the quality of water released from its reservoirs during hydroelectric power generation. Here, TVA is pioneering the use of various devices to increase dissolved oxygen content of the water in streams below major dams. Means of providing a minimum flow in these streams also are being demonstrated.

Explore ways of improving the oxygen content of waters at selected spots within a large impoundment. These water quality demonstrations are designed to deal with two effects of hot weather oxygen depletion. One is a problem for municipal water systems where certain metals such as iron and magnesium are present. Without sufficient oxygen, these metals dissolve and remain in solution in the water, posing a removal problem. Another effect of summertime oxygen depletion is on fish which require deeper, cooler waters with sufficient oxygen for their well-being. TVA is studying possible ways of establishing sanctuaries within reservoirs for such fish as the striped bass.

Demonstrate that it is economically feasible to reclaim abandoned mine lands or to reclaim long-neglected hillsides to restore water quality and heal the land itself. Abandoned mica, feldspar and clay mines in western North Carolina are being reclaimed through a cooperative program involving State authorities, private companies, and landowners. And it is a working model of what can be done anywhere in the Nation. In southeastern Tennessee, where decades of copper mining and processing have left a barren landscape on which nothing grows naturally, TVA is demonstrating with the cooperation of a private firm that even this land can be restored to productive uses.

-2-

Return the bald eagle, the golden eagle, the osprey, the giant Canada goose, the peregrin falcon and the river otter to their historic range in the Tennessee Valley. Flocks of geese have been established in several states of the region. A nesting bald eagle has been established in the Valley. The States of the region are active partners in this effort.

Improve fish habitat in reservoirs through cooperative activities involving State fish and game agencies and private citizens acting through sportsmen's organizations. In this way, fish spawning, juvenile survival and fishing success has benefitted all across the region.

Improve habitat for waterfowl in the region. Despite an abundance of water resources of various kinds, the Valley had little natural waterfowl habitat. Through the years, TVA has done a great deal to improve habitat for waterfowl and for other forms of wildlife in its various programs. Much of this work has been in cooperation with a number of private groups with an interest in one or another kind of wildlife. Placement of wood duck boxes, bluebird boxes and other nesting boxes and houses for other species is an example of some of these activities. Farmers and woodlot owners have been given technical help in improving conditions for small game animals on their property. Fish farmers have had a source of technical help in getting the most out of their operations.

Demonstrate and encourage cleanup of severely polluted waters. Such activities have resulted in elimination of mercury as a problem in Pickwick Reservoir in north Alabama, and cleanup of mercury contamination of a stretch of the Holston River in southwest Virginia. There is even activity to deal with stream pollution resulting from certain types of agricultural runoff. This demonstration is showing that farmers are willing to invest in animal waste management systems for their lands, provided they can get some help and guidance from knowledgeable Federal agencies.

Help around 100 Valley communities to deal with water shortages, especially during times of drought, and with development and implementation of a groundwater protection plan. Groundwater conservation is one of the most important issues emerging now in the entire water resource area, and one of the most complex.

Demonstrate the possibilities of waste heat aquaculture. In the Tennessee Valley, there are opportunities for using the heat of cooling water, that now goes to waste, in commercial production of catfish and several other species. Private investment in such a facility is now being invited by TVA.

In short, TVA is, in our judgment, making a major contribution to protecting and enhancing America's fish and wildlife resources.

We hope these views will contribute to the record of your hearings and your consideration of them will be most appreciated.

PRESIDENT
Eugene Nicholas

PRESIDENT ELECT
Robert G. O'Della

VICE PRESIDENT
Larry G. Morris

VICE PRESIDENT
Eugene G. Wright

**KENTUCKY — TENNESSEE
WATER POLLUTION CONTROL ASSOCIATION, INC.**



SECRETARY-TREASURER
D. Elmo Lunn

PAST PRESIDENT
Turner Dunn

DIRECTOR
George M. Ely, Jr.

DIRECTOR
K. Ray Harrington

June 19, 1985

The Honorable Gordon J. Humphrey
Chairman, Subcommittee on Regional
and Community Development
Senate Office Building
Washington, D.C. 20510

Dear Senator Humphrey:

This letter is for the purpose of transmitting a copy of a recent action of the Kentucky-Tennessee Water Pollution Control Association. The membership is quite concerned about the Administration proposal to drastically reduce the appropriation to the Tennessee Valley Authority.

It is possible that the Administration has not been made fully aware of the value of TVA to State and Regional water quality control programs. The attached resolution attempts to emphasize the value of TVA to our programs and underscore the necessity of maintaining their level of effort.

We would respectfully request that the attached resolution be made a part of the official record of your Committee actions.

Sincerely,

D. Elmo Lunn
Secretary-Treasurer
Kentucky-Tennessee Water Pollution Control Association

DEL/GPW/slk D/2

150 Ninth Avenue, North • Nashville, Tennessee 37203

RESOLUTION

WHEREAS, the Kentucky-Tennessee Water Pollution Control Association and Tennessee Valley Authority Air and Water Resources Division share mutual concerns and program interests in preserving, protecting, and improving water quality conditions within the State of Tennessee, and

WHEREAS, TVA has clearly demonstrated their willingness to take the lead in developing Reservoir Management Plans and in implementing various facets of such plans; thereby, setting a good example for other agencies to follow, and

WHEREAS, TVA has been a proven leader in the research and development of effective ways to mitigate water quality problems via reservoir and river basin approaches, and

WHEREAS, TVA has willingly provided technical assistance, field support, laboratory and analytical capabilities to the water quality control programs of the State, including but not limited to:

- North Fork Holston River mercury contamination abatement effort
- Cherokee Reservoir restoration effort
- Boone Reservoir pollution identification, modeling, monitoring, and development of a comprehensive management plan
- Ft. Loudoun Reservoir PCB assessment
- Improvement in dissolved oxygen (D.O.) concentrations via research and development techniques at selected TVA dams
- Nolichucky River Basin abandoned mica mines reclamation
- Chattanooga Creek environmental assessment
- Piney River task force participation and modeling of impacts of water withdrawals upon sensitive aquatic species; and

WHEREAS, TVA has willingly accepted and actively participated in implementing its designated management agency responsibilities for controlling non-point sources of pollution on lands under TVA ownership or control, and

WHEREAS, the budget reductions currently being proposed by the Reagan administration will drastically reduce most TVA programs and will completely eliminate all water resource programs; thereby leaving a void which no existing agencies are able to fill,

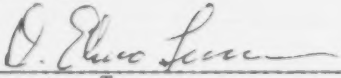
NOW, THEREFORE, BE IT RESOLVED, that the Kentucky-Tennessee Water Pollution Control Association expresses its deepest concerns about the serious impacts the proposed budget reductions will have on the overall water

quality conditions in the State of Tennessee, and by these actions formally requests a re-evaluation of the current budget proposal for TVA, and

BE IT FURTHER RESOLVED, that the Kentucky-Tennessee Water Pollution Control Association is hereby requested to furnish a copy of this Resolution to the United State Senators and Representatives from the states of Kentucky and Tennessee and the United States Environmental Protection Agency Region IV Office, and

BE IT FURTHER RESOLVED, the Resolution shall take effect from and after its adoption, the welfare of the State of Kentucky and the State of Tennessee requiring it.

ADOPTED:


Secretary-Treasurer

INTRODUCED:


Robert G. O'Dette
President-Elect

as D/2

Frances D. King
702 Franklin Street
Chattanooga, Tn. 37405

July 12, 1985

Mr. Gordan McDonald
c/o Senator Gordan Humphrey
U.S. Senate Office Building
Washington, D. C.

Dear Mr. McDonald:

I am writing as you requested concerning the conversation we had about the Tennessee Valley Authority. Some of the points and questions I have are as follows:

1. I know the TVA hospital insurance is less than \$14.00 for full family coverage. Should they have such cheap rates for a government organization? I would like to know if the TVA pays the difference for the employee or do I?
2. Why does the TVA buy city transit tickets at the full rate and then sell them to the employee at \$.35 each? I can't afford to pay for some one else to ride a bus. My daughter has to pay a dollar to ride the bus home from work and I assure you she does not make as much as a TVA employee.
3. In the name of conserving energy the TVA purchased a large fleet of vans so the employees could have a ride and not use their cars. I for one would like to know just what that program costs the tax payer or better yet the RATE PAYER like me.
4. I worked for a paint contractor as the bookkeeper for over a year. I was also the one that wrote the pay checks so I know what the Union Pay was at that time and I know for a fact the TVA rate was .50¢per hour more just because it was the TVA. WHY?
5. In the Chattanooga Times on 7/9/85 it stated in an article about the TVA their morale was so low at the Watts Bar Plant they have hired an outside contractor to come in and question each employee as to why they were so unhappy. It is only going to cost \$3 million dollars to question 4000 employees. That is \$750. per each unhappy employee. That in its self would lower my morale. I wonder how much of a rate increase this will cause. I am enclosing the article for your record.
6. How in the world does a small business loan office fit in the TVA program? I thought their business was to generate electricity. They are loaning a Grundy County farmer \$50,000 to start a vineyard and winery. What does growing grapes and generating electricity have in common? There goes another rate increase.
7. The TVA has built a very large office complex in the city of Chattanooga. At the outset it cost over \$5000 to put up a board fence around the area. From there on it has been a joke as to the costs. It would be nice to get the cost of this building. Not the figures TVA would like to us believe, but the REAL COSTS. Like the

Page Two.

\$50,000 pastel painting for the lobby.
Oops, there goes another rate increase.

8. The TVA has also gone into the Solar Water Heater business. On PBS there was an energy saving program and they were discussing the solar water heater. They said it would take 5 or more years to recover just the cost of the water heater and that they were not for all locations. They really advised against the heater on the whole. Oops, there goes another rate increase.

9. I don't have the cost at my finger tips but it might be "nice" to know more about their Electric Car boondoggle. There is a super test driving track located just off of Amnicola highway in Chattanooga that is better than our city streets. Why should the TVA think they could build a car and market it when the auto makers have all the know how and they (the auto makers) have had problems with the electric car.
Oops, there goes another rate increase.

10. The TVA built what is known as the Raccoon Mountain project. This is a project where they built a pump station to pump water from the Tennessee River to the top of Raccoon Mountain and hold it in a man made lake till they need more power in the peak hours. When it first started the TVA said it would cost more to pump the water up then they could gain while letting it run down to generate electricity. Needless to say it cost a lot more to build then they said it would. Oops, there goes another rate increase.

11. The TVA has hired a public relation person to help give them a better public image. They are only paying her \$30,000 a year. She has to answer questions and help explain some of the "jokes" they pull. Personally I think that she has the hardest job in the TVA system. I think if she could pull that off she is really a top notch PR person.
Oops, there goes another rate increase.

To the last building, nuclear plant or project, the cost is always a lot more then it should be. The national debt would be a lot less if were possible to recover the costs wasted on the nuclear plants they started and now they are moth balling or scrapping. At some of them they are selling the equipment at 10¢ on the dollar.
OOPS, THERE GOES ANOTHER RATE INCREASE.

Why can't the TVA be made to operate on a competitive basis like a good business should be run? If they would generate electricity only maybe the nation would not need to be so worried about the national debt.

I have lived in the same house for 38 years. In the past 15 years my electric bill has gone from 18.00 per month to 87.00 a month and we are told another rate increase is on the way. Personally I can't afford any more of the TVA boondoggles, PR Persons, pastel paintings or what have you.

In closing there is a joke being told around Chattanooga.

"Did you know that they don't allow TVA employees to look out of the office windows before noon? This is so they will have something to do in the afternoon"

Thanking you,

Francis O'King

LAND BETWEEN THE LAKES. ASSOCIATION

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Golden Pond, KY 42231 502/924-5602

July 18, 1985

Senate Committee on Environment and Public Works
c/o Mark Haynes
410 Senate Dirksen Office Building
Washington, D.C. 20510

Gentlemen:

This letter is being submitted for inclusion in the record of TVA's oversight hearings being conducted by the Senate Committee on Environment and Public Works.

In 1963 the Secretary of the Interior, Stewart Udall, recommended that TVA develop Land Between The Lakes (LBL) as a national demonstration area because TVA's flexibility would allow such diverse activities as resource-related research; regional development; technology transfer; professional development; and cooperative educational opportunities to coexist with recreation and thus provide a diverse array of public benefits from the property.

Accordingly, 22 years ago, President John F. Kennedy announced that the Land Between The Lakes (LBL) would be developed by the Tennessee Valley Authority (TVA).

Over the years, this Federal landholding has developed into an important and significant demonstration in the fields of outdoor recreation, environmental education, and natural resources management in the United States. Its location in western Kentucky and Tennessee is near the center of the U.S. population; it encompasses almost 170,000 acres in an area of the country where there are few other large tracts of public land; and it is bordered on three sides by two of the largest man-made bodies of water in the United States and a connecting canal, providing 300 miles of shoreline.

Last year over 2 million visitors from all 50 states and 20 foreign countries came to LBL.

LBL is the hub of a \$150 million tourism industry in Kentucky alone and contributes significantly to Tennessee's tourism industry. In 1984, LBL visitors directly contributed \$45 million to the local economy and created an estimated 2,000 full-time jobs. LBL has also been a magnet drawing additional public and private investment to western Kentucky and Tennessee. For example, its existence was a major influence on the State of Kentucky's decision to build the multimillion dollar Lake Barkley State Resort Park near an LBL main entrance.

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Senate Committee on Environment and Public Works
July 18, 1985

But LBL's benefits extend far beyond the local area. In addition to providing an outdoor recreation setting for people of all ages and backgrounds, LBL also serves as an outdoor laboratory for students and professionals to research, develop, demonstrate, and disseminate information on new programs and techniques in outdoor recreation, environmental education, and resource management.

In this living laboratory, people participate in a range of activities available at no other one place in the country: fishing and hunting, astronomy and anthropology workshops, wildlife photography, solar energy demonstrations, timber harvesting, and many others.

LBL provides professional development in the fields of resource management, recreation, and environmental education. TVA does this by bringing university students, faculty members, and other professionals to LBL for firsthand study of multiple resource management. Through a mix of internship programs, conferences, and seminars, TVA helps transfer ideas and technology to other public and private organizations.

LBL and the University of Kentucky have developed an outdoor education training program for those who work with the handicapped. This program has already spread to 12 southeastern States and the District of Columbia.

LBL's eagle restoration project has demonstrated that an endangered bird population can be reestablished in its former breeding range. TVA sponsored this highly successful project with other government and private agencies, businesses, and citizens. As a result of TVA's experience with eagle restoration, a nonprofit organization called Eagle Trust, International, has decided to move its operations to LBL.

Primarily because of LBL's unique forest management program, TVA has been involved in an international natural resources training program for government officials of less developed nations. Because many of these countries have limited areas, their leaders come to LBL to learn how to acquire many diverse benefits from one piece of land.

In cooperation with USDA and the U.S. Army, LBL and TVA played an instrumental role in the development of an effective chemical control agent now used Nationwide for ticks--a major nuisance and public health problem throughout the United States.

LBL is such an ideal outdoor laboratory that the National Science Foundation has selected it to be part of the National Experimental Ecological Reserve Network. That means that LBL is one of 96 sites that will ensure long-term availability of field research for scientific use.

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Senate Committee on Environment and Public Works
July 18, 1985

In addition to indicating the variety and value of LBL's programs, these examples suggest the widespread support LBL enjoys from the scientific and educational communities; from local, State, and Federal government agencies; and from the general public.

The American people recognize the national asset they have in Land Between The Lakes. Indeed, over one thousand citizens who feel strongly about it formed a private, nonprofit organization last year to help preserve and improve LBL for future generations.

This Land Between The Lakes Association is working outside the Federal system to secure private sector financing for certain LBL-related activities and to provide the people needed to expand LBL's program capabilities.

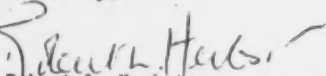
But even with this considerable support from the private sector, LBL's educational and demonstrational efforts would be severely curtailed or terminated if its funding is eliminated or is reduced to simply allow the area to remain open.

From an oversight perspective, I think it is particularly significant that LBL's appropriation for operations has been nearly stable since 1981 despite a 30-percent increase in visitors during the same period. LBL's ability to handle an increased workload without a corresponding increase in appropriations is proof of its efficient management.

The proposed Federal budget and the Senate Budget Resolution assume that, once orphaned, LBL will be embraced by some other agency. There is a major fallacy to this premise. Either funding would be continued, which is unlikely, and the public would experience no real savings, or the value of Land Between The Lakes to the Nation would be severely diminished and the public's past investment squandered.

Because of the potentially drastic ramifications that would affect LBL's resource and education programs, and the regional economy should the Administration's budget proposals be accepted, it would be appreciated if this letter and enclosed fact sheet were incorporated in the record of the TVA oversight hearing.

Sincerely,



Robert L. Herbst
Chairman, Board of Trustees
Land Between The Lakes Association

Enclosure
cc: TVA Board

FACT SHEETBACKGROUND INFORMATION ON IMPACT OF CLOSING LAND BETWEEN THE LAKES (LBL)

LBL is the second largest contiguous Federal ownership (the Great Smoky Mountains National Park is number 1) east of the Mississippi River where public lands are at a premium. TVA is managing and developing LBL as a national demonstration in outdoor recreation, environmental education, and resource management. LBL serves as the focal point for a \$150 million annual tourism industry. A study conducted by Murray State University found that the total dollar impact of the LBL's existence in Fiscal Year (FY) 1981 was approximately \$44.7 million. The impact in 1984 would be greater because annual visitation at LBL has increased from 1,641,296 in FY 1981 to 2,078,984 in 1984 for a 26.7 percent gain.

If LBL were closed, over 300 employees would be affected and approximately 1,800 regional jobs in many, many businesses would be adversely impacted.

Programs and Services

LBL offered more than 6,200 programs to the general public and resident groups in FY 1984.

An estimated 250,000 people participated in education/recreation related programs during FY 1984.

LBL visitors represented all 50 States, Washington, DC, plus twenty foreign countries.

Camping in family campgrounds and group camps exceeded 200,000 visits in 1984.

Another 450,000 visits were recorded at LBL's informal use areas.

Natural Resource Management

Resource stewardship activities are conserving and improving the forests and fields, wildlife and fisheries populations on the 275 square miles of LBL.

About 225,000 hunter visits were recorded in 1984.

Deer hunters alone spent over \$1.5 million within 25 miles of LBL.

About 250,000 visits associated with wildlife viewing, nature photography, and other nonconsumptive wildlife uses generated \$2.8 million last year.

Fishermen coming to LBL numbered 264,000 in 1984, spending \$5.3 million in the immediate area. Another 410,000 came across the lake to fish LBL's secluded embayments.

The cooperative farming program is worth more than \$1 million annually to area farmers.

The timber harvest program accounts for about 100 full time jobs and adds over \$1 million annually to the regional economy.

Transfer LBL to Another Agency?

In 1963, President John F. Kennedy, in agreeing with the recommendations of the Secretary of the Interior, charged TVA to develop and manage LBL as a demonstration of "how an area with limited timber, agricultural and industrial resources can be converted into a recreation asset that will stimulate economic growth of the region." The major goal, then and now, is to develop the area into a recreation complex under a multiple-use philosophy that would attract millions of visitors annually.

If LBL were transferred to another agency, various programs that currently exist under TVA would be reduced or eliminated. The major fallacy of transferring LBL to another public agency, however, is that other agencies, like TVA, would require congressional, State, or local appropriations to operate the area; there would be no real savings to the public. A transfer to the private sector would require a complete change in LBL's character--allowing development, commercial concerns and eliminating educational and free use to the public.

Additional Information

For additional information, contact Mr. William R. Giles, Executive Director, LBL Association, Golden Pond, KY 42231, phone (502) 924-5897.



July 26, 1985

The Honorable Quentin Burdick
Subcommittee on Regional and Community Development
Committee on Environment and Public Works
U.S. Senate
Washington, DC 20510

Dear Senator Burdick:

It is our understanding that the Subcommittee on Regional and Community Development will hold a hearing on July 30 to discuss the Tennessee Valley Authority. In response to your letter of July 22, we respectfully request that this letter be considered a Statement for the Record for that hearing.

The National Association of Conservation Districts (NACD) wishes to go on record as supporting the efforts of TVA to assist the soil conservation programs of the conservation districts in the 201-county TVA region.

The assistance of TVA has been very helpful in bringing to the landowners of the region the real problems caused by soil erosion. Of course, the benefits of erosion control to TVA are longer reservoir life and less wear to hydroelectric generation equipment.

Let me outline for you some of the activities that TVA has helped to support in recent years in the region.

First, this cooperation has grown out of interagency agreements developed in each state to promote an acceleration of soil conservation activities within that state. The recent Secretaries of Agriculture and the Board of TVA have promoted this interagency cooperation.

Resource Management Conservation Farms are identified in each county to demonstrate state-of-the-art conservation practices for the entire farm. These farms are then used for educational purposes at field days and on other occasions.

TVA has assisted conservation districts in acquiring no-till drills for use in conducting demonstration plantings on the lands of cooperating landowners. Records are kept on the conservation tillage and comparable conventional tillage plantings to show landowners the savings in costs, as well as soil from conservation tillage.

TVA staff has assisted in staging and promoting field days at which whole farms undergo a facelift with the installation of all necessary conservation practices in one day. These field days have been heavily attended.

National Association of Conservation Districts
Rm. 730, 1025 Vermont Ave., N.W., Washington, DC 20005
Phone (202) 347-5995

The Honorable Quentin Burdick

Page 2

July 26, 1985

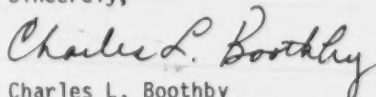
In addition, TVA has helped support research at the state agricultural experiment stations on irrigation efficiency, effects of topsoil thickness, and various rotations.

The results of this activity and interest by TVA have been considerable. Soil loss per acre is estimated to have been reduced by 4 tons per acre in one 21-county area. This is a substantial reduction, but there is more work yet to be done to continue to reduce soil losses to tolerance levels.

Additionally, the interest of TVA has spurred the formation of a 201-county interagency steering committee to coordinate the work of all agencies in soil conservation efforts.

On behalf of the conservation districts in the Tennessee River Valley, we welcome the involvement of TVA in the soil conservation efforts of the region. We hope this work can be continued in future years.

Sincerely,

A handwritten signature in cursive script that reads "Charles L. Boothby". The signature is written in dark ink and is positioned above the printed name and title.

Charles L. Boothby
Executive Vice President

STATEMENT BY WILLIAM E. BIVENS, PROJECTS DIRECTOR, ON BEHALF OF THE NATIONAL ASSOCIATION OF DEVELOPMENT ORGANIZATIONS, BEFORE THE SUBCOMMITTEE ON REGIONAL AND COMMUNITY DEVELOPMENT OF THE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS, U.S. SENATE, JULY 30, 1985.

INTRODUCTION

Mr. Chairman, members of the Subcommittee on Regional and Community Development, I am William Bivens, Projects Director of the National Association of Development Organizations (NADO).

I am pleased to have this opportunity to testify on behalf of NADO's members as your subcommittee considers the future of the Tennessee Valley Authority. We are particularly mindful of the bipartisan support that the members of this subcommittee have given to TVA over the years.

NATIONAL ASSOCIATION OF DEVELOPMENT ORGANIZATIONS

NADO was founded in 1967 by a group of economic development districts to encourage the creation and retention of jobs in rural areas and small communities. Today our members are multi-county planning and development organizations and other state and local agencies which help local governments and the private sector to work together on business, community, economic and rural development programs.

DEVELOPMENT DISTRICTS

For thousands of communities, development district staffs provide the only professional assistance to governments, businesses and citizens in the field of economic development. By working cooperatively through development districts, local governments and the private sector can maintain and create jobs with a minimum of control from Washington and maximum local participation. Development districts have become an essential part of the "institutional infrastructure" in much of rural America.

Development districts engage in activities which assist local governments to become more efficient and help local businesses to survive and expand. They provide the basic staff which gives small communities access to development expertise essential to local efforts to improve depressed economic situations.

ECONOMIC CONDITIONS VARY WIDELY

NADO's members serve rural and small metropolitan areas across the country. In the areas where we work, we are concerned about the economic well-being of the entire region. For example, the economic health of Watertown, South Dakota, or Cheyenne, Wyoming, depends on the outlying counties which surround the city. When the farmers are suffering or a plant closes in the region, the areawide economy is affected, just as it is helped when the farmers are prospering and new jobs are being created in our communities.

We believe that this is also true for our nation. If a rural or urban area's economy is depressed, the entire country should be concerned and efforts should be made to help people at the local level to improve their situation. That is what TVA has done over the past 50 years.

I would also like the subcommittee to consider the particular problems which continue to be faced by many rural areas and small cities.

RURAL ECONOMIC DEPRESSION

The general economic recovery of the past two years has bypassed many rural areas. The prolonged economic recession beginning in 1980 has retarded rural economic growth and diminished the ability of rural areas to retain, let alone attract, people. While metropolitan population has continued to grow at the same rate as during the 1970s, the growth rate for nonmetropolitan areas has fallen to about 60 percent of that enjoyed during the past decade, largely due to the greater severity of the economic recession in small towns and rural areas. As pointed out by USDA's Economic Research Service, "Unemployment, discouraged workers, and involuntary shifts from full-time to part-time work schedules all increased more rapidly among nonmetropolitan residents than those in metropolitan areas."

The nonmetropolitan economy has failed to perform as well as the metropolitan economy during the 1980s. Not only have there been problems in the agricultural sector, but also many of the nonfarm industries in rural America are mature, slow-growth industries that tend to relocate to low-wage locations such as Third World countries. One result is that by 1982 the nonmetropolitan unemployment rate exceeded the metropolitan rate by two percentage points, and our research shows that the rural rate was still above the national average in mid-1984.

Another result is that in 1983 the nonmetropolitan median family income was only \$20,938, while the metropolitan median income was \$26,488 (27 percent higher). In fact, while the metropolitan median increased by 17.3 percent between 1980 and 1983, the nonmetropolitan median increased only 15.9 percent (while the Consumer Price Index rose by 20.9 percent). One effect of this was that the nonmetropolitan poverty rate increased from 15.7 percent in 1980 to 18.3 percent in 1983.

Rural America includes virtually all of the areas of severe and prolonged poverty. All of the counties that have had consistently low incomes since 1960 are nonmetropolitan. In short, rural America is the home of an economic underclass.

As the Subcommittee considers the future, we ask that you keep the following facts in mind about rural areas:

Over-Specialization by Economic Sector - Rural areas are often more dependent upon one or two economic activities for the majority of employment. Dominant activities vary from one area to another. Mining, agriculture, forestry, fishing and tourism are the usual major employers.

Isolation - Rural areas are often more physically and culturally isolated from major markets. Rural manufacturing firms are often not as aware of changes in buying habits as firms closer to major consumer areas.

Transportation - Many rural areas lack the air, rail and highway facilities to attract and hold business. Adequate transportation facilities are not only absent in many rural areas, but others such as secondary highways and bridges are poorly maintained due to a lack of funds.

Unemployed Are Exported - Unemployment figures for rural areas not only are statistically unreliable, but also are often misleading because the unemployed leave the labor force, if not the area, after a period of unsuccessful job searching. Youth outmigration is still a problem.

Small Community Tax Bases Makes Debt Financing Difficult - Rural communities often lack the ability to finance public facilities to attract businesses on their own. The small population and tax base of many rural communities effectively prohibits any expansion of existing publicly-owned utilities without outside help. At the same time, in many small towns the local banks have been selling, not buying, tax-exempt bonds, because changes in the tax laws make these bonds less attractive to small institutions. Yet, the congress has approved, with the support of the Administration, further restrictions on the issuance of Industrial Development Bonds which have been the only way for many rural governments to compete for development with big cities (which have a much larger tax bases and more resources to attract new development.)

Rural Areas Lack Capital Markets - A 1981 study done for the U.S. Department of Commerce reported that the unmet capital demand is highest in rural areas; small firms have the most difficulty obtaining capital; and independent firms are at a disadvantage in capital markets. For both the farmer and the small business person in rural America, the availability and cost of borrowing money is a major problem. The transformation of American lending institutions is having a profound effect on rural areas. Until recently rural businesses could count on doing business with their local bank which was safely isolated from the vicissitudes of international money markets. For rural banks, the cost of funds was often below the prime rate. This is no longer the case and rural businesses and farmers pay interest rates the same as or higher than urban entrepreneurs.

Historic Demand Shows Greater Need in Rural Areas for Basic Facilities Aid - Rural areas have historically sought different types of federal assistance than urban areas. Nonmetropolitan areas have tended to receive more per capita in community facilities assistance, in business and industrial development and in natural resources outlays than urban areas. Urban areas have tended to receive more per capita in defense contracts, in housing and in transportation spending.

Poverty Indicators Higher for Rural Areas - The incidence of poverty is significantly higher in rural areas -- at least 35 per cent of the nation's poor are in rural areas. Rural people experience poorer health than urban dwellers and there is a shortage of medical services in rural areas. The incidence of substandard housing is three times higher in rural than in urban areas. Per capita income in rural areas continues to lag substantially behind the national average.

Farmers Face Financial Problems - The cost of money has risen faster than any other item in the production of crops, and many farmers are facing a serious problem because they have excessive debt loads. In the 1970's some farmers were able to survive economically by increasing their debt load by borrowing against their increasing land values. When land values began to decline in 1980 a large group of farmers (perhaps as many as ten percent) were burdened with excessive debt loads and are vulnerable to bankruptcy. In many rural areas these bankruptcies will have a very detrimental effect on local economies. The value of farm land already has eroded local tax bases which depend heavily on real property taxes.

THE FEDERAL RESPONSIBILITY

The federal responsibility for promoting the economic welfare of the nation is little disputed. Differences arise as to the extent of responsibility and the methods to be employed in meeting these obligations.

We believe that the federal government has a responsibility to encourage, in fact to foster, economic development in rural and urban areas. Not all communities are equally endowed with economic resources and the effects of broad macro-economic policies do not fall evenly across the land. In fact, we see an abundance of cases in which federal policies benefit the economies of a few relatively affluent communities at a cost to others which have higher unemployment and lower household incomes. (For example, the procurement of major weapons systems is limited to a few firms in wealthy urban areas.)

The continuation of an effective federal focus on the solution of rural economic problems is extremely important for the future of our nation. The Tennessee Valley Authority plays a unique role as a research and demonstration agency contributing to appropriately scaled solutions at local, state, or national levels. Our hope is that the Subcommittee on Regional and Community Development will find ways to strengthen TVA's ability to contribute to the solution of rural problems all over the nation. One possibility might be the strengthening of constructive relationships between TVA and the Economic Development Administration, which is a federal agency with both a nationwide responsibility and an existing local delivery system.



**National
Association of
Towns and Townships**

July 29, 1985

The Honorable Gordon J. Humphrey
U.S. Senate
531 Hart Senate Office Bldg.
Washington, D.C. 20510
Attention: Mark Haynes

Dear Senator Humphrey:

It is our understanding that you are holding hearings in your capacity as chairman of the Regional and Community Development Subcommittee on the policies and programs of the Tennessee Valley Authority (TVA)--in particular TVA's community and regional development programs. The Board of Directors of the National Association of Towns and Townships (NATaT) would like to ask that this letter be submitted as part of the record of your hearings.

On behalf of over 13,000 members belonging to NATaT, the Board of Directors would like to commend the work of the TVA--in particular the many accomplishments of the community and regional development division. Given their budget and the actual dollars invested in various projects, TVA has generated a large number of new jobs throughout the southeast region of the U.S. Established in 1983, TVA's Existing Industries Program alone has created over 7,500 job opportunities with 3,800 of those jobs being created during the first five months of 1985. NATaT applauds this program and believes it could be a very useful model in other parts of the country.

Most of the TVA's success in economic development is based on a philosophy that NATaT and its National Center for Small Communities (NCSC) share--the retention and expansion of existing businesses over business attraction initiatives. A major factor affecting distressed commercial and industrial areas is lack of capital. TVA engages in joint efforts with agencies like the Appalachian Regional Commission (ARC) to provide these areas with the needed funds to promote growth and development. NATaT believes that such efforts, for the amount of money invested, are extremely worthwhile and should be continued and expanded.

Towards this goal, NATaT has found the community and regional development work of TVA extremely useful in delivering services to its members. Using TVA publications, expert advice and the examples set by TVA's successful innovation projects, NATaT is working to disseminate information about TVA's work in other states. We believe that TVA's programs are a potential, invaluable resource to all of our members, and we hope that they will be continued and expanded so that we can achieve a broader distribution of TVA products and processes to other towns, townships, and small communities nationwide.

In conclusion, NATAT is very supportive of the direction TVA's community and regional development programs have taken and we continue to be impressed with its outstanding achievements. We believe these programs should be continued and that the U.S. Congress and the federal government should work to ensure that TVA's work in community and regional development is expanded to reach as many distressed areas nationwide as possible. We thank you for this opportunity to make our views part of the record.

Sincerely,

Michael Cochran

Michael Cochran
President



NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION

1800 Massachusetts Avenue, N.W. Washington, D.C. 20036/202-857-9500

July 22, 1985

The Honorable Gordon J. Humphrey
Chairman, Subcommittee on Regional
and Community Development
410 Dirksen Senate Office Building
Washington, D. C. 20510

Dear Mr. Chairman:

On behalf of the National Rural Electric Cooperative Association, a service organization comprised of nearly 1,000 rural electric systems in 46 states, we wish to provide comments on the proposed budget for the Tennessee Valley Authority at the oversight hearings before your Committee.

We strongly believe that the seventy percent (70%) budget cut proposed by OMB would, in essence, destroy the institution of TVA as it is mandated in the TVA Act and as it has functioned for more than a half-century in demonstrating, encouraging and fostering improved approaches, to community, economic, agricultural and natural resources development.

NRECA is greatly concerned that the proposed cuts would seriously impair TVA's ability to transfer its knowledge of successful community and economic development approaches to organizations in the area which have served as a model to other parts of the United States and other countries.

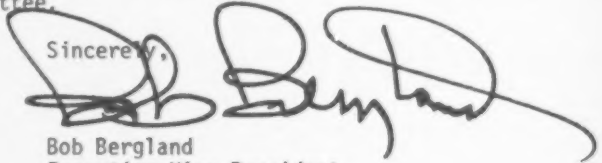
We support continued funding for TVA's resource development programs at the level at least equal to the agency's fiscal year 1985 funding level of \$129.5 million.

Since 1933, rural electric co-ops and TVA have worked together on a variety of successful programs: power generation and distribution, rates and contracts, energy use, research and development, energy utilization, load forecasting, and economic and industrial development. These programs have functioned to strengthen the economy of rural America. They are even more essential now that the rural economy is in dire straits. Support of the TVA programs at the level at least equal to the agency's fiscal 1985 funding level is essential to encourage entrepreneurial growth and encourage rural economic growth.

A strong rural economy means a strong America. A healthy TVA can immeasurably contribute toward these ends. Attached you will find a resolution adopted by our membership in support of a continued strong TVA.

I appreciate this opportunity to present the views of NRECA before this distinguished subcommittee.

Sincerely,



Bob Bergland
Executive Vice President

BB:nb

Attachment

Resolution Adopted at the 43rd Annual Meeting
of the
National Rural Electric Cooperative Association
February 3-6, 1985

Support for TVA Resource Development Programs

The U.S. Office of Management and Budget has recommended to President Reagan that funds for TVA's resource development programs be reduced by seventy percent (70%) from the 1985 funding level of \$129.5 million to less than \$40 million.

TVA has already suffered cuts in its resource development programs of approximately thirty-nine percent (39%) since 1980.

The seventy percent (70%) budget cut proposed by OMB would, in essence, destroy the institution of TVA as it is mandated in the TVA Act and as it has functioned for more than a half century in demonstrating, encouraging and fostering improved approaches to community, economic, agricultural and natural resources development.

The National Rural Electric Cooperative Association is greatly concerned that the proposed cuts would seriously impair TVA's ability to transfer its knowledge of successful community and economic development approaches to NRECA member organizations in the Valley and across the Nation as well as its ability to serve as a full partner in NRECA's national rural jobs creation campaign.

We support continued funding for TVA's resource development programs at a level at least equal to the agency's fiscal year 1985 funding level of \$129.5 million.

NATIONAL STONE ASSOCIATION

1415 ELLIOT PLACE, N.W. • WASHINGTON, D.C. 20007 • 202-342-1100

July 12, 1985

Senator Gordon J. Humphrey
Committee on Environment and
Public Works
Subcommittee on Regional and
Community Development
United States Senate
410 Dirksen Building
Washington, DC 20512

Dear Senator Humphrey:

I am writing in support of the Tennessee Valley Authority. I respectfully request that you include my letter in the Proceedings of the Oversight Hearings on TVA, July 15-16 and 22.

My knowledge of the Tennessee Valley Authority goes back to the early 1970's when I worked with the field staff of the National Fertilizer Development Center as a cooperator in the commercial testing of experimental fertilizer products. More recently, as Director of Aglime and Chemical/ Specialty Products Marketing for the National Stone Association, I have worked with TVA on the implementation of an aglime business management program for aglime vendors, originally developed by agriculture economists on the NFDC staff for use in the Valley, but which, at our request, they adapted for national application. At the present time, TVA is a primary source of information and guidance for our organization and the crushed stone industry which we represent, on the complex subject of flue gas desulfurization technology.

I strongly urge the Committee on Environment and Public Works to continue its full support of the Tennessee Valley Authority. Its programs are broad in scope and reach many people. In the agricultural area, for example, many of the efficient, low cost fertilizers used by American farmers today are produced using fertilizer manufacturing processes and formulation techniques originally developed by TVA. Regarding agricultural education, the TVA Aglime Vendor Program, although originally intended as a business management training vehicle for aglime vendors, has provided the source material for training programs on the agriculturally important subject of soil acidity and liming. These programs have been presented to and attended by farmers, farm supply dealers, vo-ag teachers, bankers, and other agricultural decision makers at several locations in the midwest.

In the environmental area, as the primary supplier of limestone to the utility industry, the crushed stone industry has been directly concerned with developments relating to flue gas desulfurization technology. The

Senator Gordon J. Humphrey
July 12, 1985

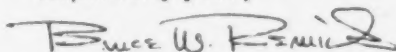
Page 2

Tennessee Valley Authority, through its Division of Fuels in Chattanooga, Tennessee, has been most helpful to this association and its members by keeping us informed of technological and other developments in FGD. However, TVA support has gone beyond strictly the dissemination of information in this area. Members of the Chattanooga staff have participated in annual marketing and technical committee meetings of the association to discuss with the membership the various aspects of and problems relating to FGD. Stone producers who have attended these sessions now have a much clearer understanding of the whole FGD area. I bring this to your attention because I am certain that TVA has extended this same level of support to other organizations and industries with an interest in FGD with the same positive result.

The programs discussed in the preceding paragraphs represent only a part of the broad range of activities in which TVA is involved. Although we tend to associate TVA with the counties in the Valley, many of its programs and activities are national in scope.

It is my hope that the decision of the Senate Committee on Environment and Public Works will be to recommend that the Tennessee Valley Authority be allowed to operate at its present level of activity during the coming fiscal year and for the foreseeable future.

Respectfully yours,



Bruce W. Remick
Director of Aglime and
Chemical/Specialty Products Marketing

BWR/pjb



NATIONAL WILDLIFE FEDERATION

1412 Sixteenth Street, N.W., Washington, D.C. 20036-2266

(202) 797-6800

July 29, 1985

HAND DELIVERED

The Honorable Quentin N. Burdick
Committee on Environment and Public Works
United States Senate
Washington, DC 20510

Dear Senator Burdick:

Thank you very much for the invitation to submit written testimony to the Senate Environment and Public Works Regional and Community Development Subcommittee for consideration during the oversight hearings on the Tennessee Valley Authority (TVA).

The National Wildlife Federation (NWF) is a not-for-profit, conservation-education organization with 4.5 million members and supporters throughout the U.S. NWF has members and affiliated organizations in all of the states serviced by TVA. In Tennessee alone NWF has 12,500 members, many of whom benefit from TVA programs.

Over the years NWF and TVA have cooperated on many projects, and although NWF and TVA have not agreed on everything, we have many mutual interests. The majority of our working relationship with TVA has been productive and, we believe, valuable to resource conservation not only in the TVA area, but across the country. TVA's function as a demonstration agency has contributed much in the resource management field.

NWF and TVA have cooperated on a number of projects over the years. TVA has been a member of NWF's Corporate Conservation Council since that group was formed several years ago. Other significant areas of cooperation have included raptor research and

Burdick
July 29, 1985
Page 2

education, acid-rain control and wetlands restoration and management.

TVA has a unique ability to try out new ideas and technologies, which, if successful, make reliable information available to others so that the new ideas and technologies may be replicated. They also have the flexibility to undertake some high-risk demonstrations, in which failures, as well as successes increase our knowledge and provide benefits. Some of the demonstration programs that TVA has undertaken include:

Clean Coal Burning Technologies - TVA has developed the Atmospheric Fluidized Bed Combustion process. They have completed the pilot phase and in September, TVA will begin construction of a 160 megawatt demonstration plant. This process allows high sulfur coal to be burned with reduced SO₂ air pollution.

Air Pollution Control Equipment - TVA has been a leader in researching both wet and dry "scrubbers" to clean flue gases.

Land and Water 201 Program - In cooperation with several other agencies, and leadership from the Department of Agriculture, TVA has developed an active Land and Water 201 program designed to reduce soil erosion, improve water quality, increase farm income, and serve as a national model of multi-agency cooperation.

Energy Conservation - TVA will shortly undertake its one millionth energy audit. With a goal of 5000 megawatts of power from energy conservation and load management by the year 2000, TVA has been a leader in the promotion of energy conservation techniques.

Ethanol from Wood - TVA research to develop cost effective methods to produce ethanol from scrap hardwoods and other unused biomass is well underway and should provide a model for national production.

Raptor Restoration - Programs now underway in cooperation with state agencies in the region have restored nesting bald eagles to the Tennessee Valley. A captive breeding program is now beginning at Land Between the Lakes in cooperation with a private organization. NWF and TVA have cooperated on raptor education and research projects.

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Dissolved Oxygen - TVA has developed an assortment of baffles to be used on utility turbines to increase the dissolved oxygen content of water below hydroelectric dams, thereby improving fish habitat.

Reservoir Fisheries Research - TVA has been a leader in establishing fishery management techniques in reservoirs. Since the elimination of the U.S. Fish and Wildlife Service's National Reservoir Research Program in 1983, TVA has stood alone as the federal agency responding to nationwide needs for large scale fishery research on reservoirs. With over 1,650 reservoirs in the U.S. larger than 500 acres, providing 150 million user-days of fishing and generating over \$3 billion in total expenditures by anglers, TVA conducted research is vital to the nation.

Wetlands Restoration - TVA and NWF are cooperating to develop the technology for utilization of artificial wetlands as part of a treatment system for sewage effluents. The wetlands will be used in conjunction with established primary and/or secondary treatment systems to provide a low-cost, low-maintenance form of additional treatment. The wetlands will help small communities meet water quality standards and provide the other environmental benefits that wetlands produce. This project is in the planning stage and is expected to be operational in fiscal year 1986.

Others - TVA also has: completed reclamation of abandoned mine lands; included in its coal purchase contracts a requirement that coal mine operators be in compliance with the reclamation laws; instigated groundwater research aimed at the special karst formations of the Tennessee Valley; examined better methods to control invasive aquatic plant species; used weir dams to maintain in-stream flows near power plants; developed networks to improve environmental education; and helped to set up recycling centers.

Because of TVA's multiple assignments in power production, stewardship of natural resources, flood and navigation control, and agricultural and economic development, the agency often faces conflicting priorities. To solve such conflicts TVA has developed internal methods to look at competing interests by using teams of experts from many professional disciplines to assure that problem solving considers all viewpoints and responsibilities of the agency.

Burdick
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TVA has a long history of involvement with local, state, and other federal agencies, and with industry, public interest organizations and private individuals. This approach allows TVA to make good use of its appropriated funds and of the dollars from ratepayers due to its working partnership with others having goals in common with TVA.

NWF and other conservation groups have taken a special interest in TVA's Land Between the Lakes, a unique unit of federal land. LBL is a national model for environmental education, research, and outdoor recreation. In addition LBL is one of the largest single units of federal land of its nature in the eastern U.S., which means that it has great value to wildlife. The affiliated organizations of NWF are concerned that LBL could be harmed by attempts to reduce the TVA budget. A resolution supporting continuation of TVA natural resource funding and opposing land transfers away from TVA was passed by all NWF affiliates at our annual meeting in March of 1985 (copy attached).

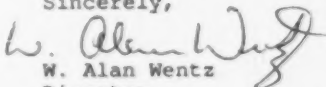
NWF supports continued funding of natural resources programs of TVA and we look to that agency for continued development of important demonstration efforts. We are concerned that if the proposed cuts in the TVA budget are carried out many valuable programs will be lost. Some of these include: national demonstration programs for air, water, land and forest resources; energy and environmental education programs; water management projects, such as monitoring, drought-related water supply studies, groundwater technical assistance, and best management practices for point and non-point pollution controls; raptor restoration efforts; the system of 11 university-based environmental and energy education centers; assessment of acidification trends in streams and reservoirs in the Southern Blue Ridge Province; the Data Base, which provides information on the distribution and status of populations of sensitive or unique species and habitats for environmental review and land-use planning purposes; dissolved oxygen research; demonstrations of improved methods of solid waste management and resource recovery, including reduction of hazardous waste land disposal; and reclamation activities on abandoned mine lands. All of these, and other, programs will be in jeopardy if natural resource funding is not continued.

Burdick
July 29, 1985
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NWF urges the Subcommittee to examine carefully the functions and purposes of TVA, and especially its environmental-natural resource programs. We believe that your examination will show TVA to be, on the whole, a viable, dynamic organization that is deserving of the continued support of Congress. We are confident that few other federal agencies can match the standard that TVA has set.

Thank you very much for the opportunity to present our views.

Sincerely,



W. Alan Wentz
Director
Fisheries and Wildlife Division

Enclosure

Resolution No. 26

IMPACT OF CLOSING LAND BETWEEN THE LAKES (LBL)

WHEREAS, Land Between the Lakes (LBL) is the second largest contiguous Federal ownership (the Great Smoky Mountains National Park is number one) east of the Mississippi River where public lands are at a premium. TVA is managing and developing LBL as a national demonstration in outdoor recreation, environmental education, and resource management; and

WHEREAS, LBL serves as the focal point for a \$150 million annual tourism industry. A study conducted by Murray State University found that the total dollar impact of the LBL's existence in Fiscal Year (FY) 1981 was approximately \$44.7 million. The impact in 1984 would be greater because annual visitation at LBL has increased from 1,641,296 in FY 1981 to 2,078,984 in 1984, a 26.7 percent gain; and

WHEREAS, over 300 employees would be affected and approximately 1,800 regional jobs in many, many businesses would be adversely impacted if LBL were closed; and

WHEREAS, more than 6,200 programs to the general public and resident groups in FY 1984 have been provided; and

WHEREAS, an estimated 250,000 people participated in education/recreation related programs during FY 1984; and

WHEREAS, visitors represented all 50 states, the District of Columbia, and twenty foreign countries; and

WHEREAS, camping in family campgrounds and group camps exceeded 200,000 visits in 1984; and

WHEREAS, another 450,000 visits were recorded at LBL's informal use areas; and

WHEREAS, resource stewardship activities are conserving and improving the forests and fields, wildlife and fisheries populations on the 275 square miles of LBL; and

WHEREAS, about 225,000 hunter visits were recorded in 1984; and

WHEREAS, deer hunters alone spent over \$1.5 million within 25 miles of LBL; and

WHEREAS, about 250,000 visits associated with wildlife viewing, nature photography, and other nonconsumptive wildlife uses generated \$2.8 million last year; and

WHEREAS, fishermen coming to LBL numbered 264,000 in 1984, spending \$5.3 million in the immediate area. Another 410,000 came across the lake to fish LBL's secluded embayments; and

WHEREAS, the cooperative farming program is worth more than \$1 million annually to area farmers; and

WHEREAS, the timber harvest program accounts for about 100 full time jobs and adds over \$1 million annually to the regional economy; and

WHEREAS, President John F. Kennedy, in 1963, in agreeing with the recommendations of the Secretary of the Interior, charged TVA to develop and manage LBL as a demonstration of "how an area with limited timber, agricultural and industrial resources can be converted into a recreation asset that will stimulate economic growth of the region." The major goal, then and now, is to develop the area into a recreation complex under a multiple-use philosophy that would attract millions of visitors annually; and

WHEREAS, various programs that currently exist under TVA would be reduced or eliminated if LBL were transferred to another agency. The major fallacy of transferring LBL to another public agency, however, is that other agencies, like TVA, would require congressional, State, or local appropriations to operate the area; there would be no real savings to the public. A transfer to the private sector would require a complete change in LBL's character -- allowing development, commercial concerns and eliminating educational and free use to the public;

NOW, THEREFORE, BE IT RESOLVED that the National Wildlife Federation, in annual meeting assembled March 14-17, 1985, in Arlington, Virginia, strongly urges Congress to continue funding of TVA natural resource management programs at least to the 1984-85 level and that no land transfers take place either between agencies or to the private sector.

UNIVERSITY OF NEW HAMPSHIRE

Department of Forest Resources
College of Life Sciences and Agriculture
James Hall
Durham, New Hampshire 03824
(603) 862-1020

June 27, 1985

Senator Gordon J. Humphrey
Committee on Environment and
Public Works
Subcommittee on Regional and
Community Development
U.S. Senate
410 Dirksen Building
Washington, D.C. 20512

Dear Senator Humphrey;

I am writing in support of the Tennessee Valley Authority. I respectfully request that you include my letter in the proceedings of the oversight hearings on TVA, July 15, 16, and 22, 1985.

As you well know, TVA is a multi-faceted organization, the functions of which have been periodically criticized as inappropriate to the public sector. I can understand this sentiment, because there are, indeed, certain segments of TVA that would appear to be better positioned in the private sector. One cannot so easily, however, break up an organization into component parts. As we have already seen with the breakup of AT&T, the whole may operate with much greater efficiency than does the sum of the parts. Likewise, transferring the entire organization to the private sector would likely result in the loss of functions critical to the consumer, but not profitable for industry.

While TVA may need some "tune up", I believe its value to the taxpayer of the United States is sufficient to warrant its continued operation in the public sector, and I will attempt to justify this position. Since I am most familiar with the operation of the Fertilizer Development Center, I will restrict my comments to this branch of operations.

Since World War II American agriculture has undergone some revolutionary changes which have resulted in our consumers devoting a smaller portion of income to food than possible in any other country of the world. Furthermore, American farmers supplied export grain which went a long way toward offsetting the effect of increasing oil costs on our balance of payments. Without fertilizer, and without continued changes in the fertilizer industry to meet changing agricultural demands, neither of these would have been possible. The fertilizer industry is not, however, constituted in such a way as to readily support the major research and development efforts required to meet changing demand. Most of the country's fertilizer is produced by either small local companies or by small units of larger corporations. If each were required to support its own R&D unit, fertilizer would be substantially more expensive and fertilizer technology would not be so well developed. The result would be lower agricultural productivity which, in turn, would mean less grain for export and more expensive food domestically. It is for these reasons that TVA became the home for the national fertilizer technology R&D program, and it is for these reasons that this role should be maintained.

Any Research and Development program requires an integrated approach, including basic research, pilot plant operation, full scale production, and utilization research. Deletion of any aspect of the program decreases the effectiveness of the whole. I understand that the research program, in particular, is being critically examined.

It is very difficult to evaluate the returns from money spent on research, because it is often difficult to assign a direct dollar value to knowledge. This is one of the reasons corporate research programs are often the first casualty of decreasing profits. Without fertilizer utilization research, however, there is always a chance of making an error reminiscent of that made by Leibig in formulating the first fertilizer (ca. 1840). While formulation and manufacture was based on sound theory, the nutrients contained within the fertilizer were not available to plants, and the fertilizer was therefore worthless. At today's narrow profit margin, American farmers cannot afford to purchase fertilizers that are not 100% effective in their intended use. Effectiveness can only be assured through a thorough testing program.

Fertilizer utilization research is, however, no longer a simple process of effectiveness screening. We live in a society that has become concerned with the effects of pollution on the quality of life, and there is no question that fertilizer can become a pollutant. In addition, low profit margins have led farmers to search out the least costly source of nutrients, which is often municipal sludges or other societal wastes. These have an even higher pollution potential, not only for the environment, but for inclusion of toxins within foodstuffs themselves. It is necessary, therefore, that any fertilizer research program include provisions for testing plant uptake of both nutrients and toxins as well for testing the environmental impacts of the nutrient management programs in common use. The prime beneficiary of this type of research is the consumer, so the research must be publicly supported or it will not be undertaken.

The research branch of the National Fertilizer Development Center has an exemplary record of successfully investigating and reporting plant and environmental effects of modern fertilization programs. Their annual reports are replete with information valuable to scientist, teacher, and manager alike. One might, of course, question whether the research function should be turned over to USDA and university research scientists. In considering such an option, however, it must be kept in mind that these two groups have functions different from that of the TVA scientists, and it is unlikely that they could be so effective in providing the same information. The three groups should in no way be considered as competitive; they are complementary in their functions. Already, TVA supports university scientists where they are better able to provide a needed answer and USDA assumes those research tasks for which its scientists are better qualified. The agricultural science community seems to be unique in its spirit of cooperation and, as a result, the functions of the TVA research scientists could not easily be undertaken by the other two communities. I urge your continued support of TVA research in agriculture as a valuable asset to the scientific community as well as for the role it plays in practical fertilizer management.

As a final note, I understand that President Reagan has recommended the Valley Agricultural Development program be discontinued. I believe this is symptomatic of a serious error of thinking within the executive branch. I am very much a supporter of free enterprise, but US agriculture is simply no

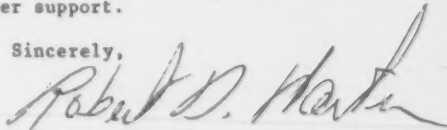
longer free. A history of governmental actions supporting inexpensive food (which I support as a consumer) has led to removal of agricultural commodities from the supply and demand system. The precipitous removal of agricultural supports, both advisory and monetary, without concomitant policy assuring farmers of a reasonable level of income is a serious and dangerous departure from recent governmental programs. Someone seems to have forgotten that the foundation of our greatness is an agricultural system capable of supporting a vast industrial complex with more than adequate food supplies. Recent policy is causing an erosion of this foundation, and if the erosion is allowed to continue unchecked the whole system could fall. It has long been a "truism" that an army marches on its stomach. Even tripling the Pentagon budget will be of little use if agriculture is allowed to continue floundering.

As a part of the package, continued support of agricultural research is necessary to ensure the wellbeing of future generations. Research has provided the American farmer with the capability of producing more food more efficiently than any other society of the world. We cannot, however, assume that the trend will continue by momentum while research funding is decreased. In particular, the TVA research program has provided the taxpayer with good value for the dollar, and I hope you will look favorably upon continued funding for their efforts.

To summarize my comments:

- 1) The National Fertilizer Development Center is the only US organization conducting research and development work on fertilizer. As the fertilizer industry is now constituted, there would be little incentive or ability of the private sector to assume this R&D responsibility.
- 2) Utilization research is an integral part of any R&D effort. A cooperative association now exists between TVA, USDA, and university researchers, with each group having rather well defined functions and responsibility. Any alteration of this arrangement would be less efficient and more costly to the taxpayer.
- 3) To maintain a strong society, we must maintain a healthy agriculture. The continued support of agricultural research and information dissemination is essential to future societal wellbeing. TVA is an integral part of this system and should continue to receive taxpayer support.

Sincerely,



Robert D. Harter
Professor of Soil Chemistry



NORTH AMERICAN LAKE MANAGEMENT SOCIETY

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JUL 26 1985

Senator Gordon J. Humphrey
Chairman, Subcommittee on Regional and
Community Development of the Senate
Environmental and Public Works Committee
United States Senate
Washington, DC 20510

Dear Senator Humphrey:

This letter and enclosed information have been written in support of TVA's water resource programs. The North American Lake Management Society requests that this letter and enclosures become part of the TVA Oversight Hearing record that the Senate is presently conducting.

Respectfully Submitted,

William H. Funk, President
North American Lake Management
Society

Enclosures

TVA REGIONAL NEEDS

From TVA publications such as "Is the Water Getting Cleaner," "State of the Environment in the Tennessee Valley - 1983," and TVA's "1983 Annual Report," one can gain an appreciation of economic and environmental conditions in the seven-State area and the importance of TVA programs working to overcome the problems. The TVA area is still poor; unemployment is high; and State/local governments cannot afford services we take for granted in other States. How can a county worry about effective septic tank installations or waste disposal when it can hardly afford to run its school buses? TVA programs are working to cope with regional waste management, regional water quality issues, and groundwater protection. These programs are trying to work with all units of government as a facilitator to help them help themselves. Everything from floodplain management and setting up recycling centers to working with local government to establish effective protection of municipal underground water supply recharge areas can fill a need of the people in the area -- a need not met by other political entities because of lack of funding, lack of authority, or lack of political resolve.

The one thing that stands out is the regional nature of these TVA activities. Surface and groundwater resources do not respect political boundaries, and political entities do not often work well together. For proper management of surface and underground waters and for their effective protection, a regional or watershed approach is needed, as is the capability to get various political entities working together. Water resources management is not as effective as it should be in America, and the TVA approach is more effective for the good of the taxpayers.

Another reason for continuing TVA land and water programs involves the impact of the vast reservoir system on environmental quality and the protection of the Federal investment in the reservoirs. TVA publications clearly show that pollution of TVA reservoirs and tributaries is a serious concern -- both from point source discharges as well as from poor land management practices which create nonpoint source discharges. Institutional impediments and lack of political resolve have resulted in this water quality damage. In addition, the creation of the dam system by the Federal government has resulted in some adverse changes in environmental quality. TVA is finding solutions to these pollution problems to ensure continued protection of the public investment in the reservoirs and benefits they provide and to remedy problems caused by reservoirs (which include weeds, downstream water quality damage, restoration of fisheries and wildlife, and streambank erosion).

NATIONAL BENEFITS OF TVA

Several unique TVA efforts serve as models for the entire Nation in managing water resources and reservoir quality. The USDA-TVA cooperative agricultural land and water management program covering the entire TVA area targets cooperative local, State, and Federal initiatives to priority areas in the seven States to stem soil erosion, increase agricultural productivity, and implement nonpoint source pollution control measures. This effort -- if it achieves effective cooperation among many units of government -- will be a milestone. But beyond this, it may result in cleaner reservoirs and may serve as a model for how the Nation should cost-effectively address nonpoint source pollution.

Another TVA activity involved preparation and implementation of water quality management plans for TVA reservoirs in cooperation with local and State governments. Just initiated several years ago, the process might be able to make up for gaps in institutions and lack of political resolve as well as to promote cooperation among political entities to achieve implementation of what is needed to restore and protect water quality in reservoirs. TVA is the only water development agency to initiate this effort; and when coupled with reservoir land management plans that stress nonpoint pollution control, this could promote an integrated land-water management framework to protect the taxpayers' investments in water projects and in public drinking water supplies.

One problem common to many water projects is that releases from dams may cause water quality problems for fisheries, drinking water supplies, and industries downstream of the dam. This type of damage is caused below 17 TVA dams and is common throughout the country. TVA is using aerators in a lake and devices hooked to hydroelectric turbines to increase oxygen in dam releases and has constructed a reregulation weir at a project to provide minimum flow releases to restore environmental quality. Similar progress needs to be made across the country in addressing degraded water quality coming from dam releases.

Whether the issue is developing environmentally acceptable ways to manage weeds in reservoirs, developing new techniques for mitigating pollution caused by dam releases, or identifying the best areas for siting heavy industry so that environmental damage is minimized, it appears that the experience and output from TVA programs are valuable to the rest of the country. This

knowledge must be disseminated and new challenges must be addressed. The Nation has a lot to learn from TVA -- not only from the results of its programs, but also from its policies. The age of building is over; it is time to operate and maintain water resources projects to protect their viability, to generate additional public benefits, where possible, and to promote effective management and institutions to prevent future problems from occurring. There also seems to be another theme emerging. It is that economic and energy development is compatible with -- and virtually dependent on -- the maintenance of environmental quality objectives. It is time for the entire Nation to focus on cost-effective protection of public water projects and on a positive attitude in integrating economic and energy development objectives with environmental quality.

Another opportunity for TVA and its seven State area might be in developing and documenting the cost-effectiveness of Federal expenditures for natural and agricultural resources management. Parts of the Tennessee River Basin could be used as experimental or demonstration areas for developing and testing cost-effective solutions to pressing economic, energy, or environmental problems facing the Nation. Especially in regard to reservoir and water quality management, the cost effectiveness of existing Federal or State approaches could be determined and compared to new or innovative solutions. Once tested, these approaches could be incorporated through the appropriations process into other agencies' programs or could be the basis for national legislation.

In times of fiscal constraint, a premium should be placed on developing more cost-effective management approaches, maintaining and preserving benefits of water projects currently built, and funding cost-effective programs first. TVA can develop, evaluate, or implement less costly solutions to reservoir

pollution and water management problems; monitor the water quality effectiveness of the hundreds of millions of Federal dollars being spent for erosion control; determine the reductions in acid rain reaching lakes and reservoirs when certain air pollution control technology is installed. But most importantly, extend effective approaches for restoring and protecting the quality of lakes and reservoirs to other agencies having the responsibility to protect the taxpayers' investment in Federal water projects and public water supply reservoirs.

In his 1977 book entitled Regionalization of Water Resources, the eminent environmental engineer, Daniel Okun said, "The most admired regional effort in the United States is the Tennessee Valley Authority, Mecca for professionals from throughout the world...the most innovative and successful water-related regional agency in the U.S." If TVA is so highly thought of, and so successful, such drastic program cuts are not wise. The USACE, Bureau of Reclamation, and U.S. Geological Survey have not been scheduled for water quality management budget cuts. It is not equitable for Congress to turn its back on citizens living in TVA's seven State area while funding the water resources needs of citizens across the rest of the country. Everyone from the farmer, the sportsman, the tourist, the businessman, and the ordinary citizen will be hurt.



The Ohio State University

College of Agriculture

Room 100
2120 Fyffe Road
Columbus, Ohio 43210-1099
Phone 614-422-6891

June 21, 1985

The Honorable Gordon J. Humphrey
Committee on the Environment and Public Works
Subcommittee on Regional and Community Development
United States Senate
Room 410, Dirksen Building
Washington, D.C. 20512

Dear Senator Humphrey:

As Chairman of the Oversight Committee for Appropriations to the Tennessee Valley Authority, you are in a position to stem the disastrous tide of budget cuts currently slated in the FY 1986 Budget for the Tennessee Valley Authority. It is my understanding that the U.S. Senate passed a resolution, recommended by the Office of Management and Budget, that would reduce the TVA FY 1986 Budget for TVA Agricultural Programs by 70%. It is my understanding, also, that the U.S. House of Representatives has passed a bill that would reduce funding for TVA by 10% from its FY 1985 appropriation. Quite obviously, even a 10% cut when combined with the current level of inflation, will have a deleterious impact on the vitally needed agricultural programs of TVA.

Although I reached the mandatory age for retirement of administrators at The Ohio State University on June 30, 1982, I continue to work part time for the University. It was during my 22 years as Dean of the College of Agriculture and Home Economics, Director of the Ohio Agricultural Research and Development Center (Agricultural Experiment Station) and Director of Ohio Cooperative Extension Service that I became closely associated with the agricultural programs sponsored by the Tennessee Valley Authority. Those contacts and experiences have led me to conclude that the expenditures on TVA agricultural programs rank among the most cost effective governmental programs that I have observed in a lifetime of working in and for our nation's agricultural industry.

TVA's Agricultural Programs should not be looked upon as representing expenditures of public funds, but rather as investments of public funds in the agricultural economy of our nation, which indirectly has had, and will continue to have, substantial impact on the total economy of our nation.

Although TVA sponsors several agricultural programs in cooperation with agricultural business and industry, as well as in cooperation with our nation's land-grant universities and colleges of agriculture, and with farmers in nearly a dozen states, I will make reference to just one of those programs which was a joint program between TVA and some of our nation's Colleges of Agriculture. I refer to the Rapid Adjustment Program which involved disadvantaged young farm families. Let me give you a specific example of such a disadvantaged young farm family in

The Honorable Gordon J. Humphrey
Page Two

Adams County, Ohio. This young family is comprised of Trevor and Betty Grooms and their two children. When we started working with them in the Rapid Adjustment Program, they were living in a dilapidated log cabin and were attempting to scratch out a living on a 100-acre hill farm. Both Trevor and Betty worked off the farm in order to "hold body and soul together", and yet satisfy their life-long desire to remain in agriculture. We cooperated with TVA, a local bank, and a local farm supply cooperative to make the Trevor and Betty Grooms farm a demonstration of what could be done on the poor and highly erodible soils of Adams County. At the outset, their "balance sheet" showed a loss of nearly \$2500 during the calendar year previous to becoming Rapid Adjustment Cooperators. Our Cooperative Extension Service County Agricultural Agent, and County Home Economist showed Trevor and Betty Grooms how they could get into the feeder pig business and how (by adopting approved agricultural practices) they could convert the red ink on their balance sheet into black ink. The Tennessee Valley Authority provided modest amounts of recommended fertilizer formulations, the local bank and farm credit agencies provided the capital needed, and the local farm supply cooperative assisted with farm supplies. To make a long story short, this disadvantaged young farm family developed a feeder pig business which within five years enabled them to make a down payment on an additional 275 acres of land, plus build a new three bedroom home, and become substantial taxpayers on both the State and Federal levels!

TVA Demonstration Farms, as they are called, have been established in dozens of counties throughout the area from Louisiana and Arkansas on the West, to North Carolina and Virginia on the East. Their impact on local communities, on the State and on the local economies of our nation, have been tremendous. That impact will continue for those families, and for their children as well as for their children's children, for all time in the future! I make that statement based on the fact that within ten years of Trevor and Betty Grooms starting with us in the Rapid Adjustment Farming Program, they were named by the Ohio Young Farmers' Association as the Outstanding Feeder Pig Producers in the State of Ohio!

Other examples could be provided of what this type of effort on the part of TVA has meant to disadvantaged young farmers, to communities, to their States, and to the Nation. It would be folly and faulty economics (and truly without basis in logic) for the FY 1986 budget for TVA's Agricultural Programs to be cut by 70% as has been proposed by the U.S. Senate. A 10% reduction from FY 1985, as passed by the U.S. House of Representatives, will be serious enough, but in realization of the difficulties facing the U.S. Congress, I can understand why we must tighten our belts on a great many programs. I cannot, however, understand why the U.S. Congress would wish to "gut" a program which does not cost, but which pays handsomely in terms of returns to our nation's economy.

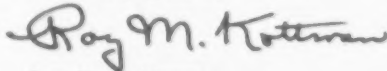
The Honorable Gordon J. Humphrey
Page Three

Please exert your very considerable influence to maintain the Agricultural Programs of the Tennessee Valley Authority as close to FY 1985 levels as you possibly can. The TVA Agricultural Program is one for which we must not let politics influence our decision, but rather let the economics of the situation (which clearly are advantageous to the nation) dictate the continuation of the TVA Agricultural Programs.

Please feel free to call on me should you wish other information concerning any of the TVA Agricultural Programs which, over the past quarter century, I have observed as being so very significant in building our nation's economy.

I shall be most grateful if you will place this letter into the Oversight Committee Proceedings when those proceedings are published.

Sincerely yours,



Roy M. Kottman
Vice President for
Agricultural Administration
Emeritus

RMK:mc



To advance the science and art of good land use

July 12, 1985

Honorable Gordan T. Humphrey
Chairman, Sub-Committee on
Regional & Community Development
United States Senate
Washington, D.C. 20510

Dear Senator Humphrey,

In recent months, I have observed the development of an innovative multi-agency approach to a significant effort to reduce soil erosion and improve water quality in the Tennessee Valley. It is important because the seven Tennessee Valley States rank among the top ten states in the nation in terms of severity of cropland erosion from high energy rainfall. Because of its fresh approach to multi-agency cooperation the program has national significance as a developmental model.

The program is called Land and Water 201. Secretary of Agriculture John Block asked TVA to coordinate the program, working closely with State USDA Food and Agriculture Councils. In August, 1984, Secretary Block, TVA Board member Richard Freeman and representatives of the seven State Governors signed a memorandum of Agreement, pledging the resources of all the State and Federal agencies in conducting the conservation program.

Since then the Governors have signed the agreement and accelerated soil and water conservation programs have been started in all seven states.

Objectives of the program, as identified by Secretary Block, are to: - reduce soil erosion - improve water quality - increase farm income, and - serve as a national model of multi-agency cooperation. - A unique part of the program is to integrate farm management and production planning with conservation plans. The strategy is to develop and introduce farming systems that are profitable for the farmer and that protect soil and water resources.

This approach was first developed in 21 west Tennessee Counties in 1979. State, Federal and local organizations started a "Save our Soil" program in an area where erosion was averaging 30 or more tons per acre per year on sloping cropland. As Chief of the Soil Conservation Service, I



observed that program as it developed and am pleased to note that a recent evaluation showed dramatic progress. Erosion rates have decreased by almost 30 percent during the first five years of the program.

Now, the lessons learned in west Tennessee are being applied across the region through Land and Water 201.

Mr. Chairman; these lessons also have significant implications for other parts of the nation where our soil and water resources are being threatened.

A great deal of synergism is generated when Federal and State agencies pool their manpower and financial resources to address a serious problem. Land and Water 201 is an idea for which the time is right. No longer can agencies "do only their own thing" They can be much more effective by working together.

Land and Water 201 has already received national recognition at conservation meetings in Washington, across the county, and at non-point pollution and other water quality meetings. I urge you and the committee, Mr. Chairman, to recognize the importance of supporting this program for the benefit of the Tennessee Valley and the nation.

Best wishes,

Norman A. Berg
 Norman A. Berg
 Washington Representative

NAB/mrw

cc: Honorable Frank R. Lautenberg
 United States Senate



STUMP HOLLOW CAMPGROUND

WATTS BAR LAKE SPRING CITY, TN. 37381
Rt. 1 Box 224C

ELEANOR G. PRATHER
(615) 266-6192

July 11, 1985

Senator Gordon Humphrey
531 Hart Office Building
Washington, D.C. 20210

Dear Senator Humphrey:

1985 marks the 15th season that my husband and I have operated a waterfront campground that we developed on the shoreline of Watts Bar Lake, one of the TVA lakes formed by dams on the Tennessee River, located between Chattanooga and Knoxville. Fifteen virtually non profit years, thanks to TVA.

Sitting here in my office on this sunny July day, looking out at our beautiful 250 site waterfront campground with only three families patronizing our business, and knowing that the highways are jammed with vacationers in recreational vehicles, many towing boats, it is difficult to find justification for the excessive public development of recreational parks.

Not only our campground, but all others in the private sector in the region of the TVA, have been either severely damaged or wiped out entirely, by unfair competition from developments either done by, or funded by the TVA. Private enterprise cannot prosper and be tax revenue producing when faced with tax subsidized competition that threatens its very existence, as is the case on TVA lakes.

The already developed TVA recreational facilities, including Land Between the Lakes, along with all other lands and properties held by TVA, not needed in the production of power, should be sold, not leased, at present market value, to private interests, and put back on the tax rolls.

It is a fact of the market place, that where there is a need, given a chance, private enterprise will fill that need. Rather than encouraging private enterprise, TVA is annihilating it. We and others, developed to fill a need. TVA undercut us.

I firmly believe that the cuts recommended by the OMB in the TVA budget, and resultant cutbacks in the scope of TVA, after a transition period, would be a stimulus to all aspects of the economy in the TVA region.

Many people in the TVA region agree with what I have said, but most are afraid to speak up, often saying that "I cannot bite the hand that feeds me".

If you will check into it, I think that you will find that National Chamber of Commerce studies show that economic development in the TVA region has been slower to progress than in any other part of the country. Has TVA been a help or a deterrent? TVA needs to make this determination before deciding on the amount of funding for TVA.

Respectfully,

Eleanor G. Prather
Eleanor G. Prather

EGP/e
Encl.
CAMPING



FISHING



SWIMMING



52-232 1353

T V A RETIREES ASSOCIATION

131 Kingswood Drive
Florence, Alabama 35630

June 28, 1985

The Honorable Gordon J. Humphrey, Chairman
Subcommittee on Regional and Community Development
Committee on Environmental and Public Works
U.S. Senate
410 Dirksen Building
Washington, D.C. 20512

Dear Senator Humphrey:

On behalf of 10,000 TVA retirees, I am writing in support of programs conducted by the Tennessee Valley Authority. I would appreciate having my comments made a part of the record for the oversight hearings on TVA in July 1985.

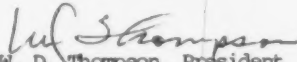
TVA is serving the Nation well. TVA's programs of economic development, fertilizer and agricultural technology and introduction, and natural resource conservation and use are innovative and effective. Many of these programs have benefited people throughout the Nation. TVA's economic development and natural resource conservation and use programs are serving as national models of public-private partnerships in stimulating progress.

TVA's national fertilizer and agricultural development programs are providing technology to help farmers produce food and fiber more efficiently for American consumers. The use of new TVA fertilizer technology is also a key factor in the U.S. farmers' success in generating a more positive trade balance. Farmers export more than \$30 billion of farm products each year. These programs yield an impressive return for the U.S. taxpayer, who is the beneficiary of much of TVA's work.

We have spent the better part of our productive lives working at TVA. We have seen these programs produce tangible results. We believe TVA has demonstrated great efficiency in managing its appropriated funds.

We urge you to consider the importance of maintaining the important work of TVA for the Nation. Thank you for the opportunity to provide this statement about the work of TVA.

Very truly yours,


W. D. Thompson, President
TVA Retirees Association

WARDEN CHARLIE TATHAM
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655 Roselawn Avenue,
Woodstock, Ontario
N4S 5S6
Phone (519) 537-6040



P.O. Box 397
Court House
Woodstock, Ontario
N4S 7Y3
Phone (519) 539-5688

June 24, 1985

Congressman Gordon Humphrey,
Chairman,
Subcommittee on Regional
and Community Development,
U.S. Congress,
Washington, D.C.
20510

Dear Congressman Humphrey:

Greetings from Oxford County, Ontario, Canada.

My municipal background goes back to the middle 50's. Over the past thirty years communities across North America have been coping with the problems of the environment, soil conservation and solid waste management, amongst others.

In travelling from New Orleans to Montreal, Toronto to San Francisco you will have difficulty finding a better agency than the Tennessee Valley Authority that will give you straight, honest (whole truth) answers.

Several years ago through the kindness of our local Valley Authority (Upper Thames River Conservation Authority) I visited Milan, Tennessee and saw what was taking place on TVA soil conservation demonstration plots. Tennessee Valley Authority experiences are not always fully transferable, but the general approach and information received is first class.

This past April we took two carloads of people to the Nashville area for a solid waste management tour. Our County of Oxford (85,000) has spent over 1½ million dollars and 10 years endeavouring to get a safe landfill site.

... 2

WAPDEN CHARLIE TATHAM
Home Address:
655 Roselawn Avenue,
Woodstock, Ontario
N4S 5S6
Phone (519) 537-6040



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Court House
Woodstock, Ontario
N4S 7Y3
Phone (519) 539-5688

Congressman Gordon Humphrey
Page 2
June 24, 1985

We do appreciate the kind co-operation we have received from the Tennessee Valley Authority people.

It would seem reasonable that where we have common problems across this continent, that we will have a win/win situation if we can share our information with one another.

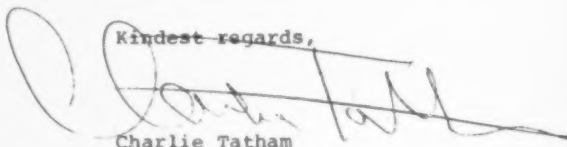
Of course the added benefits of meeting knowledgeable and hospitable people working for TVA are excellent.

Mr. Humphrey, I on behalf of the members of Council thank you for the privilege of learning from the activities that take place at the TVA.

If we can continue to share answers to the common environmental problems of North America, our friends and neighbours will thank us.

I trust that this Canadian's views can be included in the Official Congressional Hearing Records.

Kindest regards,


Charlie Tatham
Warden

CMT:bjt

TCL

that the future may know the bounties of our past

Tennessee Conservation League

1720 WEST END AVE., SUITE 300
 NASHVILLE, TENNESSEE 37203
 (615) 329-4230

Testimony Prepared for Presentation to the
 Sub-Committee on Regional Development and
 Community Development relative to Oversight
 Hearings on the Tennessee Valley Authority.

The Tennessee Conservation League is a not-for-profit, non-political membership organization dedicated to the wise use of Tennessee's natural resources and the enhancement of our environment. Founded in 1946, the League has over 18,000 members distributed across the State. We are the Tennessee affiliate of the National Wildlife Federation.

Since its inception the League has been very interested in the programs of the Tennessee Valley Authority and their impact on the natural resources of the valley and through T.V.A.'s demonstration mandate, natural resource management programs across the Nation.

Although there have been occasions when we have strongly disagreed with T.V.A. programs, we have always strived to work with T.V.A. in their overall effort on behalf of the valley and its natural resources.

In the late 1960's and early 1970's T.V.A. appeared to be drifting away from its dedication to improving the lot of the valley's natural resources and its historic partnership with the residents of the valley. Starting in the mid-1970's with the changes in the T.V.A. Board of Directors, we have witnessed the return of T.V.A. to its roots. T.V.A. is now an agency dedicated to working in partnership with the people of the valley, demonstrating that we can have economic development while insuring a bountiful supply of natural resources and a healthful environment.

In our travels we occasionally hear that T.V.A. has done its job and it is now time to do away with the agency and its programs. The Tennessee Conservation League feels very strongly that the needs for the Tennessee Valley Authority's natural resource programs are greater than ever. As with any large bureaucracy, there are on occasion

AN AFFILIATE OF THE NATIONAL WILDLIFE FEDERATION

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wasteful programs and inefficiency within programs, but from our observations T.V.A. is actively reviewing their programs on an ongoing basis, looking to terminate programs that are not producing a good rate of returns for the dollar invested and to insure that ongoing programs are being managed in an efficient manner. We, in the Tennessee Conservation League are also, to the best of our ability, monitoring T.V.A.'s natural resource and environmental enhancement programs in an effort to insure that we are getting the best return for the very limited public dollars available for natural resource conservation. We feel very strongly that the continuance of most T.V.A. programs are critical to the future of the region. We also feel that the Nation derives many benefits from T.V.A. programs. T.V.A.'s programs in forest management, wildlife management, fisheries management, water and air quality have produced management tools that have been used nationwide by resource management agencies and, in many cases, the private sector.

The Tennessee Conservation League feels that the Tennessee Valley Authority has a significant contribution to make to our Nation. There is no doubt that T.V.A. has not always realized the agency's potential, but we do feel that the recent improvements in the operation of the agency have been significant. We feel that in most instances the public's investments in T.V.A. programs have provided a good return for the dollar invested.

In conclusion, we hope that the members of the Sub-Committee on Regional and Community Development will join with the citizens of the valley and T.V.A. in a positive approach to insuring adequate opportunities for our citizens of the future.

STATEMENT OF NICHOLAS CRISLER
PRESIDENT
TENNESSEE RIVER VALLEY ASSOCIATION
BEFORE THE SUBCOMMITTEE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE
JULY 16, 1985

Mr. Chairman, I welcome this opportunity to appear before this distinguished panel. The Tennessee River Valley Association is a citizen's organization working to promote quality economic development and favorable business climate in eight states in the southeastern United States.

I want to speak to you today not only as a representative of TRVA but also as a citizen of the Tennessee Valley and an executive of a large multinational corporation with a facility in Decatur, Alabama. This is simply another way of saying that I approach my responsibility to report to you on the Tennessee Valley Authority as a practical, tax-paying businessman who wants to see the Federal budget shrink as much as anyone in this room.

In my opinion, a major reason for the groundswell of support behind reduced Federal spending is the widely held concept that Federal agencies sit in Washington and dispense funds around the Nation without knowing the local situation and without measuring whether the taxpayers got a reasonable return on their investment.

This is what makes TVA different. It is a corporation that conducts its affairs in a businesslike fashion. Unlike most Federal agencies, it has to pay attention to the bottom line. Moreover, Congress placed TVA in

the field, among the people it would serve. Neither when it was started nor today has it been in the business of making handouts. Rather, TVA grew in stature and size by helping others help themselves. Consider for a moment TVA's accomplishments in the last 50 years.

Electricity is now taken for granted in the most remote hamlet. Floods that once ravaged cities small and large are now under control. You can now move a barge from East Tennessee all the way to the Mississippi River or, through the Tennessee-Tombigbee Waterway, directly to the Gulf of Mexico. The region's natural resource base has been stabilized and strengthened. Striking advances in fertilizer and agriculture have been achieved. The Valley is one of the major manufacturing areas of the Nation.

Could any private company have accomplished this? Perhaps, but there were no volunteers at the time. Thus, as we look back, we who live and work in the Valley must necessarily point out TVA's many positive results in integrated regional resource development.

This brings us to the question: Has TVA fulfilled its mission? A direct answer to this question is: "NO." The Valley has come a long, long way. But we must also recognize that the journey to full participation in the Nation's economic mainstream is not over.

If jobs were being generated in the Valley at the same rate as the national rate since 1981, there would be 200,000 more employed here than there really are.

One of every four Valley counties has unemployment that is double the national average.

Unemployment in the Valley for 1984 was 2 percent above the national rate.

The number of discouraged job seekers increased 140,000 each year in the Valley since 1981.

While 12.4 percent of the U.S. population is below the Federal poverty line, in the Valley it's 17 percent.

In part, today's challenges in economic growth reflect the dramatic changes underway in the national and international economy. The old answers are no longer sufficient. New approaches are essential. TVA has recognized this fact and adjusted to the new challenges.

Let me try to illustrate how TVA works in the all-important area of business growth.

Back in 1981, TVA provided technical assistance to Knoxville-area businessmen, The University of Tennessee, the State of Tennessee, and local governments in the Knoxville and Oak Ridge area who had the idea that a high-tech business community could be developed there. Their reasoning was that with the technical expertise at the university, TVA and the large Energy Department installation at Oak Ridge, high-technology businesses serving these institutions and the possibility of spinoff companies was possible. In the early going, it was TVA's technical experts who gave their nights and weekends to energize the effort, which became known as the Tennessee Technology Foundation. Today, four years later, the Foundation is free of direct TVA support, relying instead on private and state funding and is making real headway in a carefully designed program to develop a cluster of high-tech firms.

This is a perfect example of how TVA works: providing technical assistance to build the infrastructure that will, in turn, permit private enterprise to grow and prosper.

It is this hands-on, feet-on-the-ground approach toward economic development that distinguishes TVA as a corporate entity from many other governmental institutions. It is also a good example of how TVA works in partnership with business, government, and community organizations to press forward with a good idea until it becomes reality.

TVA is also at the forefront in providing existing industries in the Valley with an array of technical services that help small and medium-size companies become more efficient by identifying methods to reduce operating costs and plan for new expansions. Some typical examples of how this works are the following:

A small manufacturer of wood products in Mississippi felt he was paying too much to transport raw wood from Taiwan to his plant. He consulted TVA, which did a transportation rate analysis and came up with a new routing which saved the firm \$250,000 a year. As a result, the company expanded its existing operation, moved its distribution center near the factory, and added 100 jobs.

An Alabama food processing plant found itself threatened with a closure in two days by the state unless it came up with a method of improving the working environment inside the factory. TVA environmental analysts were on the scene within hours and developed a plan that kept the plant open.

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At another factory, TVA energy surveyors came up with a way of saving the company \$300,000 a year on its electric bill by a series of conservation measures. This led to the company increasing the size of its plant and adding 400 jobs to its payroll.

Each of these achievements benefitted local businesses. But the expertise and experience TVA develops in these efforts is routinely passed along to others outside the region.

There is, of course, much more to TVA than its economic development and power programs. Its national fertilizer center in Muscle Shoals, Alabama, is responsible for development of some of the most advanced fertilizers in the world. Its flood control advances are copied throughout the nation.

In summary, Mr. Chairman, we in the Tennessee Valley--businessmen, farmers, day laborers, students, housewives--all of us depend on the Tennessee Valley Authority, not for handouts but as a contributing partner in our common pursuits.

Is TVA perfect? No, sir. I wish it would keep its electric rates lower, but they are still among the lowest in the country. I'd like to see more recreation areas along the Tennessee River, but that costs money. I wish the Valley's per capita income matched the nation, but that will take creative adjustments to adapt to changing needs and demands.

A few months ago, in his second inaugural address, President Reagan seemed to be endorsing the TVA principle, which is to help those help themselves, when he said:

"A dynamic economy, with more citizens working and paying taxes, will be our strongest tool to bring down budget deficits."

This is precisely what TVA has set out to do and, within its limited resources, has made good progress. TVA has probably done more for the Tennessee Valley area than any other single entity in the past 50 years to bring about the kind of strong economic growth, balanced with concern for an enduring healthy environment. TVA has truly found a most cost-effective way of galvanizing private enterprise. I don't know what we'd do without it.

0586e

STATEMENT OF THE
TENNESSEE VALLEY PUBLIC POWER ASSOCIATION
CONCERNING THE
TENNESSEE VALLEY AUTHORITY

July 30, 1985

Tennessee Valley Public Power Association
1201 Chestnut Street
Chattanooga, Tennessee 37402
(615) 756-6511

The Tennessee Valley Public Power Association (TVPPA) is the regional service organization representing the interests of 110 municipal electric systems and the 50 rural electric cooperatives that purchase electric power at wholesale from the Tennessee Valley Authority (TVA). These 160 distributors resell the power on a nonprofit basis to eight million consumers located in the seven Tennessee Valley states.

The distributors of TVA power are principally involved in TVA's power program, which is supported entirely by electric revenue. Contrary to some assertions that the power program is subsidized by the federal government, the power program, in fact, pays annual dividends to the U.S. Treasury to repay the federal government's initial investment in TVA's power system.

TVA's power program, of which TVPPA is proud to be an important part, has grown in large part because the federal government provided TVA and our eight million Valley residents with the resources necessary to promote human and economic development. TVA's agricultural development program took a region beset by erosion and subsistence farming and helped it develop into a modern farm economy that could take advantage of the agricultural tools that electricity could powers. TVA's economic development programs fueled business and industrial growth that could profitably use electricity made available by the power program. TVA's agricultural, natural resource, and economic development programs have been and continue to be

essential complements to the availability of abundant electric power.

Often it has been suggested that many issues facing TVA and the Valley region can be resolved by restructuring the TVA Board through an amendment to the TVA Act. At this time, TVPPA does not believe any such restructuring of the TVA Act would be beneficial, nor would it aid in the resolution of any of the complex, present or future social or economic issues facing the Tennessee Valley.

The development of the Tennessee Valley area has been due, in large part, to contributions of TVA. Amendments to the TVA Act of 1933 have been few, and a certain body of law has developed within the judicial system interpreting the Act. Because history has shown us that the TVA Act has worked relatively well, and because of the possibility that any legislative attempt to amend the Act could cause disagreement within Congress or the judiciary, as to the scope of any proposed amendments, TVPPA believes it to be inadvisable to amend the TVA Act at this time.

TVPPA believes that it is inappropriate to legislatively amend the structure of the TVA board simply to remedy perceived problems with past or present board policies. TVPPA is convinced that the oversight powers of the President and Congress can be effectively used to remedy any problems with the policies and administrative practices of past TVA boards.

The President's appointments of Chairman Dean and Board Member John Waters were important exercises of these oversight powers. The appointments have resulted in management shifts concerning important TVA policies, including renewed emphasis on cost-effectiveness of TVA programs.

The increased emphasis upon cost-effectiveness of TVA programs has been reflected in the recent moderation of TVA rate increases. Although TVA has recently announced a potential increase of 6.9 percent for fiscal year 1986, for the five-year period from fiscal year 1981 through fiscal year 1986, TVA rates will have risen only 11.9 percent. Over the same five-year period, the inflation rate has been 21 percent, almost twice as much as TVA's moderate rate increases.

There have been expressions of concern during these hearings about the issue of TVA's accountability to the ratepayers. Through various mechanisms, Valley consumers have a role in choosing governing boards of all of the 160 cooperative and municipal distributors of TVA power. With the exception of less than 50 large industrial customers and a number of governmental customers served directly by TVA, the remaining three million residential and commercial consumers of TVA-generated power are served directly by the 160 municipal and cooperative distributors. It is the distributors who have daily contact with consumers, and distributors are in a position to be of substantial help in the formulation of

policies affecting TVA operations. The members of TVPPA individually and collectively negotiate on a regular basis with TVA on matters of rate structure and other aspects of TVA power system operations. This regular rate and service negotiation process between TVPPA members and TVA is an effective method of assuring citizen input into TVA operations.

Another method of accountability which has proved to be effective is the oversight of TVA operations through the TVA Congressional Caucus, which has effectively worked with TVA, the distributor members of TVPPA, and ratepayers over the past few years in trying to see that there is a cooperative effort among all interested in TVA and among those in Congress representing the constituents of the TVA region. This cooperative effort aids and assists TVA in achieving its goals as provided by Congress in the TVA Act.

Other suggestions have been made during these hearings that TVA borrowing from the Federal Financing Bank is subsidized by the federal government. We disagree. TVPPA is unaware of any evidence to indicate that TVA borrowing in the federal market increases the cost of borrowing by other federal agencies. Also, it is apparent that the Federal Financing Bank's one-eighth of one percent interest surcharge to TVA (and consequently, its ratepayers) results in revenues to the FFB that it would otherwise not receive. The finance charge likely results in a profit, not an expense, to the FFB.

During the course of these proceedings, there has been a suggestion that there be created, within the TVA organization, an office of inspector general. There is no evidence to indicate this is necessary. TVA has provided for an effective internal auditor. The General Accounting Office has investigative powers to examine any allegations of inefficiencies or improprieties. GAO investigative powers have been used extensively in the past, when necessary, to inquire into such allegations. An office of inspector general would only add another layer of expense, and an unnecessary one at that, at a time when attempts are being made to pare back TVA expenses.

While on the subject of expenses, we concur with suggestions that one expense -- that of salaries for certain key TVA management, scientific and professional employees -- needs to be increased. Just as the old adage "you have to spend money to make money" is often true, there are times when you have to spend money to save money. TVA's inability to attract and retain these qualified people because of its inability to match competitive salaries in the private sector, has affected its ability to effectively operate its programs, and particularly its nuclear program. We recommend that the Committee urge TVA to do what it can, within existing law, to improve compensation levels for top management, scientific and professional personnel. TVA must be competitive in the

marketplace in those cases in which it has lost, or incurs the risk of losing, personnel in key positions. It is indeed ironic that TVA is required by federal law to pay prevailing wages for labor and is prevented from paying prevailing wages for management, scientific and professional personnel charged with directing the efforts of labor.

The fulfillment of TVA's mission, as this body defined it some 52 years ago, requires your continued support for TVA's non-power programs. TVA must continue to have the resources provided by the federal government to attack problems that, not addressed, will slow the economic recovery of the Valley states. Problems, such as water quality management, aquatic weed control, soil erosion control, job training, agricultural development, forestry management and recreation development are essential to TVA's fulfillment of the requirements of its Congressional charter.

Proponents of the requested budget cuts have contended that TVA's economic development mission has been fulfilled and that there is no continuing need for TVA programs to assist the Valley's economy. Although we are proud of the role that TVA has played in assisting the economic development of the Tennessee Valley, much remains to be done. Economic data for the TVA service area indicate levels of income less than 80 percent of the national average. Employment levels within the Valley are only now returning to levels of 1979, and major

areas still are below 1979 employment levels. Economic dislocation in the region has led to a renewal of a disturbing trend of outmigration, after 20 years of net gains in regional population.

Other critics of TVA programs have suggested that Valley residents should be required to rely upon the economic stimulation expected from general fiscal and tax policies. However, TVA's economists have projected that the TVA region receives only one-half of the economic benefit received by the nation as a whole from the recent tax cuts and related changes in federal fiscal policies. TVA programs promoting economic development should be expanded, not eliminated, to narrow this gap.

Finally, we believe that TVA has adequately answered suggestions that its programs duplicate programs of other federal agencies. TVA has reported that it has significantly expanded its cooperative relationships with other federal agencies sponsoring development programs in the Tennessee Valley. TVA has undertaken to coordinate the identification and availability of federal resources from all sources, whether federal, state, local, or private, permitting the Authority to multiply the impact of its development programs.

TVPPA participated in the 1982 hearings before the Senate Environment and Public Works Committee. TVPPA believes that nothing has since changed to cause modification of the

following excerpt from the Senate Committee's report which accurately reports TVA's approach to the prudent management of its non-power program:

TVA has made a concerted effort to refocus and shift their programs to take best advantage of limited resources. They continue to evaluate their programs to make them more responsive and more cost effective. They have increased the use of fees where possible to recover costs. They are transferring programs to the private sector and to other Federal and State agencies where appropriate. TVA has eliminated some programs on their own based on internal prioritization of needs. TVA's remaining economic and community development efforts will focus on the objective of promoting economic development through local initiative and self-reliance rather than continuing dependence on the Federal Government. TVA's remaining research and demonstration efforts are limited to high-risk initiatives that have potential benefits to the Nation. TVA is accelerating transferral of programs in natural resources to the States or the private sector. Yet TVA must maintain the facilities and natural resources which have been entrusted to TVA's stewardship and adequate resources for this task must be maintained.

The municipal and cooperative distributors of TVA power feel that they are important partners with TVA in efforts within the Valley to develop a better standard of living for our citizens. Yet, as TVA will quickly tell you, we are not silent partners. If we believe TVA is not acting in the best interest of ratepayers, we will be among the first to bring our views to TVA's attention. And we are vocal and insistent in doing so. TVA's role in the partnership would be crippled if it was deprived of the resources necessary to help manage our Valley's natural resources and to promote the human and

economic resources necessary to the more complete development of our region.

We recognize and strongly support the need for the federal government to seek efficiency during this deficit crisis and for TVA to perform its necessary functions in the most efficient way possible. We request, however, that you avoid placing a greater deficit reduction burden upon TVA than is placed upon other federal agencies, and we request that you make available adequate financial resources to permit TVA's non-power programs to continue their historic role in the development of our region.

STATEMENT

1042 Oglewood Avenue, N.E.
Knoxville, Tennessee 37917
July 29, 1985

The Honorable Gordon Humphrey
United States Senate
Hart Senate Office Building
Washington, D.C. 20510

Dear Senator Humphrey:

This is my statement for the official record of the Tennessee Valley Authority Congressional Oversight Hearings to be held in Washington, D.C., on July 30, 1985.

I was a whistleblower in the Tennessee Valley Authority, and I am giving a brief summary of my case.

I am a former Energy Advisor in the Tennessee Valley Authority's Home Insulation Program. I was stationed in Oak Ridge, Tennessee. In 1979, I began noticing wrongdoing committed by certain TVA employees in TVA's Home Insulation Program. I filed a grievance with my union, but the union had no management rights over quality control.

Before the grievance and after the grievance, the TVA undertook a course of harassment towards me. I then asked the TVA's Legal Counsel's Office to do an investigation of my allegations concerning the Home Insulation Program. The wrongdoing included serious deficiencies such as passing fire hazards in reinspections, performing half-done surveys, etc. The TVA approved loans for homes which did not meet TVA specifications.

At the end of the investigation, the TVA's Legal Counsel's Office would not allow me to read the report for corrections nor would they give me a copy of the investigative report. Also, at the end of the investigation, I was given notice that I was to be placed on six-month probationary status and would be transferred away from my official work station in Oak Ridge, Tennessee. The TVA was taking my position away from me. They were sending me to a district office in another city. The TVA was putting me behind a desk doing clerical work with no phone and no contact with the public. This action by the TVA was certainly reprisal. Yet the TVA denies the reprisal in their effort to cover up their wrongdoing in the Home Insulation Program and in the General Counsel's Office.

When I received the probationary notice, I fought to see the report. After the damage had been done to me in the TVA General Counsel's cover-up investigative report and the subsequent probationary notice, the TVA let me read the report; and I read it under pressure. The report had been whitewashed, covered up, toned down, information omitted, etc. The TVA had failed to protect the public; they had lied. The TVA did not want me to read the report because they knew they had

The Honorable Gordon Humphrey

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stabbed me in the back. I had furnished the TVA's Legal Division numerous documentations, statements, photographs, etc. The TVA, for example, never mentioned the photographs. In fact, the TVA sent a report to Washington, D.C., which states that I would not give the photographs to the TVA's Legal Division. The truth of the matter is that the TVA had the photographs, and they knew that the photographs told the truth. It is a cover-up for the TVA to deny that they ever had the photographs in their possession; the TVA lied. Furthermore, the TVA did not have any of my supporting documents attached to the report nor my amendment to the original statement. The TVA omitted the documentations to cover up the report.

The TVA attorneys involved should be barred from the American Bar Association and dismissed from the TVA. I had rocked the boat and had received a reprisal through the probationary status, the result of the TVA Legal Counsel's cover-up investigative report. I never accepted the probationary assignment but felt forced to resign as I knew the harassment would continue. If the TVA's Legal Division had done a fair and truthful investigation, I would not have been placed on probation. To the contrary, the others who had committed wrongdoing would have been terminated for their criminal actions.

The TVA falsely states in writing that I went back to my same Energy Advisor position where the problems continued after the investigation, and it was at that time that I was placed on probation. The TVA lied as I never went back to my position because I was being placed on probation immediately following the investigation. It is obvious that the TVA stated that I went back to the position to cover up for their reprisal. The TVA denies the reprisal.

I resigned and felt forced to do so at the end of the investigation just before the probationary period went into effect. The TVA further states that when I read the report, I made no comments. When I read the report, the TVA had me read it under pressure. I was forced to read it hurriedly and could not take notes per Herbert S. Sanger, Jr., TVA's General Counsel. In fact, Mr. Sanger was extremely rude and told me to hurry up and get out of the office. He said they had spent all the time they were going to spend on this case; that there were other important matters to pursue. What I witnessed that day in the TVA's Legal Division was everything but ethical and just. I immediately wrote a letter to TVA including Herbert S. Sanger, Jr., TVA's General Counsel, rejecting the entire report because it was a cover-up. I also requested a copy of the report under the United States Federal Freedom of Information Act. The TVA violated my initial request for a copy of the report and also violated my appeal request.

I then had to sue the TVA in 1980 for libel about the time I sued the TVA for violations of the Federal Freedom of Information Act. I then faced the TVA's exemption under the Doctrine of Absolute Immunity, all the way to the United States Supreme Court. The TVA again was not held accountable because they were protected by immunity; they were immune from being held accountable for their wrongdoing.

The Honorable Gordon Humphrey

July 29, 1985

I would now like to give you a short review of my dealings with the Tennessee delegation since May of 1980. A few examples of their roadblocks include:

Senator Baker

1. Senator Baker would not let me testify in his March 1981 TVA Congressional Oversight Hearings which I attended in Washington. I would have been the only ex-TVA employee to have testified as a critic.
2. Senator Baker omitted my statement for the official record of the hearings even though he said my statement would be included.
3. Senator Baker did not answer many of my letters to him.
4. Senator Baker put my case under the rug so to speak. He did not hold TVA accountable for their wrongdoing nor did he punish TVA.

Senator Sasser

1. Senator Sasser was the very first Congressional member I contacted in 1980. My dealings with him and his office have been a disgrace.
2. He lost 300 pages of the documentations which I gave to him in 1980.
3. I am also led to believe that his office has lied to me on several occasions.
4. Just recently, I placed 17 calls to his Washington office, and they would not return my calls.
5. Senator Sasser has never ever met with me since my case started in 1980.
6. I was told by his office when I was in Washington in March 1985 that there was no file on me. They then abruptly changed this statement saying that my communications were stored in a box in a closet and difficult to get to.
7. Senator Sasser has ignored my latest June 1985 request for a meeting and also my last letter to him dated May 30, 1985.

Senator Gore

1. Senator Gore's office on March 12, 1985, told me while I was in Washington that probably they would not touch my case because of "political reasons."
2. On May 21, 1985, while I was in Washington, I was told by Senator Gore's office that my case would "fan the fire" and hurt TVA's budget, and that they could not open this case to air it because of TVA's budget. My case would open up a can of worms.

The Honorable Gordon Humphrey

July 29, 1985

3. Senator Gore's office has not been answering my recent letters.
4. What Senator Gore preaches is the opposite of what he practices. Democracy does not work when he ignores a case of such great impact.

Congressman Duncan

1. It took Congressman Duncan over two years to finally act on my case.
2. He introduced a very weak bill H.R. 1771 in March 1983 which concerns qualified immunity for TVA instead of absolute immunity.
3. Congressman Duncan got upset with me because I had the bill exposed to the public in Knoxville in 1983. If he truly supported his own bill and wanted TVA to be held accountable for their wrongdoing and to be punished, then he would have gone public with it as he does other legislative matters.
4. Bill H.R. 1771 died in December 1984.
5. When Congressman Duncan's office refused to write me or return my phone calls earlier this year, I was led to believe the bill was not being reintroduced.
6. Congressman Duncan had decided not to reintroduce the bill, but I pressured him to do so.
7. Finally, the bill was reintroduced in April 1985. The bill is not being promoted by Congressman Duncan, and it is safe to say it will die again. He has never endorsed the bill publicly in Knoxville, Tennessee.
8. Congressman Duncan has not been instrumental in obtaining a Congressional hearing for me or I would have had a hearing in this length of time. I have the right to have "my day in court" which has been denied me for over five years.
9. Overall, Congressman Duncan's office has been a disappointment.

Congresswoman Marilyn Lloyd

1. The wrongdoing by the TVA began with the Oak Ridge residents which is in the district Congresswoman Lloyd represents.
2. She has not done one thing in over five years for those residents who have been done wrong by TVA in the Home Insulation Program. She has completely ignored the wrongdoing.

-5-

The Honorable Gordon Humphrey

July 29, 1985

Other Members of the Tennessee Delegation

1. They have ignored my letters in many instances.
2. Some have written letters which avoid the TVA being held accountable for their wrongdoing.
3. I receive a few thank you letters only for visiting their Washington offices. They omit the TVA case in their letters.

In conclusion, you can see that the Tennessee delegation has treated me cruelly and covered up for the TVA or my case would have been settled. And even though they testified in these oversight hearings in support of TVA, it was their responsibility and duty to punish TVA for their wrongdoing. The Tennessee delegation has been a complete roadblock to me for over five years. They have never given me an opportunity to testify in any type Congressional hearing or even in a meeting. In fact, I am led to believe that they do not want me to testify.

I am now into my sixth year, and I am living proof that TVA is accountable to no one much less punished for their wrongdoing. I have also dealt with numerous organizations where TVA is exempt from accountability.

I am led to believe that other TVA employees are being treated as I. However, they choose not to fight the TVA bureaucracy as I have done probably due to the time, cost, effort, courage, etc., involved.

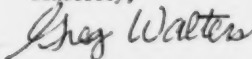
How can the TVA carry on its business when they operate so viciously and deceitfully day to day? How can the TVA expect budget funds when their Legal Division is guilty of cover-up? TVA will continue with their wrongdoing until Congress starts holding them accountable and starts punishing them. My case proves that the system is not working and that TVA cannot police themselves.

Herbert S. Sanger, TVA's General Counsel, W. F. Willis, TVA's General Manager, and S. David Freeman, former TVA Board Chairman, should be held accountable and punished for this cover-up. Above all, there should be a housecleaning in the TVA's Legal Division. When the TVA covered up my case, it led me to believe that there were other cases handled by the TVA's Legal Division that were also covered up.

A hearing for me is essential. I would win my case. A settlement in my behalf would be made. Therefore, my fight for a hearing will continue but outside the 7-state TVA service area. TVA is accountable to Congress "only if" the Congressional members make TVA accountable. It is evident in my case that the

Tennessee delegation will do nothing to correct the wrongdoing by the TVA in order to uphold justice for me and others. They are not holding the TVA accountable nor punishing them.

Sincerely,



Gregory Walters

July 6, 1985

Honorable Gordon Humphrey
United States Senate
Washington, D. C. 20510

Dear Mr. Humphrey,

I have read articles in our local newspaper lately, that would indicate you are one of the few supporters of Budget Director David Stockman's proposal to cut T.V.A.'s nonpower budget. I understand that you will hold hearings concerning these nonpower programs.

I would like to inform you of a problem T.V.A. has created in the T.V.A. Region with one of their nonpower programs, the fertilize program. In their fertilize production at the Muscle Shoals, Ala. plant T.V.A. created a byproduct, phosphate slag.

This slag contains radium-226. As much as 250,000 pounds of slag a year was produced between 1934 and 1975. The volume of slag was creating a disposal problem until the agency began selling it as an ingredient in concrete and concrete blocks. This sand like material makes concrete blocks lightweight. When homes or basements are constructed with these blocks radon gas accumulates in the building. The radon gas drawn into the lungs of occupants over a long period of time causes lung cancer.

In June 1979 a Task Force report was started on this problem. The report was inconclusive and never mentioned again. However, there are homes built over reclaimed phosphate land in Florida with readings lower than my home, which is constructed with T.V.A. slag blocks, that have had government assistance in lowering their levels of radiation.

In June of 1979 after finding that our home had a working level of .04825 we tried in vain to get our Congressmen to help us with this problem. It seems that the Congressmen in the T.V.A. Region do not want to oppose T.V.A. After all else failed we filed suit in court for damage to our health and home. We were not allowed in court because of a ten year statute of limitation law in the state of Tennessee. We did not find out about our problem until our house was ten years old. The court could have applied Federal Law since a Federal Agency was involved, but it chose not to.

We moved our family out of our home in September of 1979. We lost our home valued at \$95,000.00. It still stands vacant.

This problem involves many homes and public buildings in the Southeast. We would like to see further studies done and action taken to make these buildings safer for the individuals occupying them.

Congress funds this agency that has chosen to bury this problem. But the Congressmen in this area refuse to question the action of this government agency.

Not only should T.V.A.'s budget be reviewed, but their actions should be reviewed also. Our senators and representatives will not answer our letters or phone calls. I have no idea how to proceed.

Our attorney ask us to contact our senator and have him introduce a special claims bill to compensate us for our home. He said he could get a Florida senator to co-sponsor the bill, but we need a Tennessee senator to sponsor it. We ask Senator Albert Gore, Jr. to do this. We have been unable to get any help from him. After calling his Washington office for weeks his representative told us that it would be politically unpopular to oppose T.V.A.

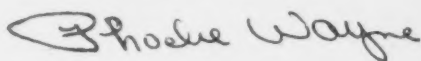
What is the power T.V.A. has over Congress? Why do they blindly fund this agency?

I have tried to keep this letter brief realizing you are a busy man. If you would like additional information and specific figures to prove there is a real problem with this inappropriately handled radioactive product I will be happy to supply you with such information.

I am afraid this letter has not conveyed the urgency of our problem. But after six years of a hopeless fight I am emotionally drained.

If you would hold a hearing on this action of T.V.A. I would be glad to come to Washington at my own expense to testify before the committee.

Sincerely,

Rhodie Wayne

FLORIDA CHAPTER
OFFICE OF THE
THE WILDLIFE SOCIETY



July 23, 1985

Sen. Quenton N. Burdick
511 Senate Hart Office Bldg.
Washington, D.C. 20510

Dear Sen. Burdick:

The Florida Chapter of The Wildlife Society appreciates the opportunity to comment on the need for support of the natural resource programs and projects of the Tennessee Valley Authority (TVA). The FY 1986 budget presented by the President calls for a 70 percent cut in the appropriated budget of the Tennessee Valley Authority. These cuts would eliminate most of the TVA's natural resource programs. While not large, these programs do serve an important function in focusing attention on improving and safeguarding environmental quality in the Tennessee Valley and on managing TVA lands for multiple-use benefits for the public.

TVA's natural resource programs encompass areas such as wildlife and fisheries, forestry, environmental education, recreation, and air and water quality. These programs impact many areas including 47 reservoirs, 300,000 acres of land surrounding these reservoirs, and the 170,000 acre Land-Between-The-Lakes national demonstration area. Collectively, all of these activities contribute to making the Tennessee Valley states a better place to live. Indeed, many of TVA's projects serve as national models for others to emulate.

All of these programs would be eliminated under the administration's proposed budget. For example, all forest and wildlife management activities for TVA reservoirs and surrounding lands would cease or be severely reduced. These activities include: the management, protection, and restoration of native game, nongame, and endangered species; and habitat restoration of coal surface mines, reservoir drawdown zones, transmission line rights of way, and water damaged bottomland hardwoods. In addition, all of TVA's fisheries improved efforts would be eliminated if the proposed budget cuts are approved.

Land-Between-The-Lakes is a powerful example of how integrated natural resource management programs can work. The area provides countless opportunities in outdoor recreation and environmental education for visitors from throughout the U.S. and abroad.

The TVA's natural resource activities in this area are of benefit not only to the Tennessee Valley region, but the entire nation. As such, the Florida Chapter of The Wildlife Society urges the subcommittee to recommend funding for TVA natural resource programs at the fiscal year 1985 level to ensure continuation of these important activities.

Sincerely,

Wayne

Wayne R. Marion
President

WRM:bf

1729 Ingleside Ave.
Florence, Alabama 35630
July 12, 1985

Senator Gordon J. Humphrey
603 Dirksen Senate Office Building
Washington, D.C. 20510

Dear Senator Humphrey:

With the upcoming hearings on the appropriations for TVA there are a couple incidents of type of management that is prevalent in the Office of Agricultural and Chemical Development (OACD) which may be of interest to you.

The enclosed internal report of OACD points out the amount of nitrogen lost in our plant operations to produce experimental fertilizers. According to the report it amounts to about 6% of the total nitrogen produced during 1984. You can ascertain that in non-governmental nitrogen plants any loss in excess of 1% is considered prohibitive. This loss of \$1. million in product would appear to be excessive even in the TVA budget.

The second incident which I bring to your attention concerns the Biomass Fuels project in OACD. the only documentation that I have is the TVA contract number - TV61592A. In this contract one E.O. Marini functioning through his Marelco Corporation received approximately \$600,000. to produce complete design plans for a wood gasifier that was to be built in Costa Rica. The only thing received by TVA was a few preliminary sketches before the contract was terminated and the above amount paid. The Design Branch of OACD has begun work on the design of a wood gasifier to be located in Costa Rica. It appears that the design of this wood gasifier is going to be paid for twice.

I am a research chemist and have been employed by TVA for 32 years. Should you find use of the enclosed information I would appreciate you not revealing the source as the climate here is not conducive for any criticism and I could lose my job.

Sincerely,


Joe W. Williard

C. H. Davis, A200 NFDC

Frank Achorn, 402 CEB

June 20, 1985

NITROGEN LOSSES FROM TVA COMPLEX

Last week you and I discussed losses of ammonia from the ammonium nitrate neutralizer and associated scrubber that is used to produce TVA's nitrogen solution and nitrogen suspensions. I have received the results of two stack gas analyses from this neutralizer and its scrubber. The resulting analyses of these samples show that in October 1984 we were losing the equivalent of 19.1 tons of ammonia per day and in June 1985 2.2 tons of ammonia per day. These gas samples are for only a five-minute period and are only an indication of the amount of ammonia that is lost during the sampling period which is usually for five minutes. However, they are an indication that we should at least investigate the amount of nitrogen we are losing from this neutralizer and other equipment within the plant.

Therefore, it was requested that Chemical Accounting give us an indication of how much loss of nitrogen occurred in the previous fiscal year from our entire complex. It was requested that it be presented on a monthly basis. This accounting data is shown in table 1. Bill McDonald also had the accounting personnel of the Division of Chemical Operations to present similar data. The data supplied by Mr. McDonald showed that the losses were actually higher than the losses recorded by Chemical Accounting. If we assume that all of the losses were as ammonia and the market value of ammonia is \$195 per ton, then the value of our loss was about \$1 million during fiscal year 1984. These data indicate we had an overall loss of 6.46 percent N in 1984. This is far too high. However, Chemical Operations is doing much better in 1985 and the projected loss is about 1,500 tons of NH₃. This is still too high and represents a value of \$292,500.

Some of the accounting and operational personnel have indicated that this data is inaccurate because of the inaccuracy of meters used in determining the data. However, it is the only data we have available and would be the type of data we would have to supply outside government auditors that request a nitrogen balance for this complex. If these data are inaccurate, then we should have recommendations from our engineers and accountants concerning alterations of equipment and procedures to improve the accuracy.

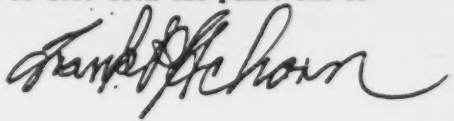
Bill Lyndon and David Sockwell have reported that they are currently working on one of these problems and are trying to improve the metering and control systems for the ammonium nitrate neutralizer (D-1) and scrubber (G-10).

2

C. H. Davis, A200 WFDC
June 20, 1985

NITROGEN LOSSES FROM TVA COMPLEX

It is recommended in addition to this work that either the Chemical Accounting Branch or the Division of Chemical Operations should report the total nitrogen and P_2O_5 loss on a monthly basis. This report should help us to set goals whereby the amount of loss from the plant can be decreased.



FPA:MLL

cc: J. E. Gahan, A204 WFDC
W. A. Lyndon, E101 WFDC
J. T. Shields, A214 WFDC
bc: E. D. Myers
E. F. Evans, SB

Table 1
Unaccounted for Monthly Nitrogen Losses
Chemical Accounting

<u>Month</u>	<u>Year</u>	<u>Total N Losses</u>	
		<u>as Ammonia</u>	<u>as Nitrogen</u>
October	1983	693	570.3
November	1983	850	699.6
December	1983	822	676.5
January	1984	149	122.6
February	1984	123	101.2
March	1984	423	348.1
April	1984	503	414.0
May	1984	235	193.4
June	1984	102	84.0
July	1984	267	219.7
August	1984	887 ^a	730.0
September	1984	140 ^a	115.2
Total		5,194 ^c	4,274.6 ^b

- a. Consider the sum of these materials instead of individual months.
b. Total loss by McDonald 5,093 tons N.
c. Value based on market price of \$195/ton of ammonia (June 17 Green Markets) = \$1,012,830.